





# Richards Topical Encyclopedia

Edited by  
ERNEST HUNTER WRIGHT  
and  
MARY HERITAGE WRIGHT

Editor for Canada  
ALBERT WILLIAM TRUEMAN

VOLUME FIFTEEN



NEW YORK  
THE RICHARDS COMPANY, INC.

PRINTED AND BOUND IN THE U. S. A. BY  
KINGSPORT PRESS, INC., KINGSPORT, TENN.

# FOREWORD TO INDEX

INDEX by EUGENIA WALLACE and IRMA FAITH. Revised by VIRGINIA BARTHEN

## TO BE READ BEFORE USING THE INDEX

WHEN you are driving along a country road and want to find a particular place, you look at the guide posts. They tell you nothing about the place, of course, but they do tell you where to find it. Now that is what an index does. It tells you where to find the information you are looking for—which volume it is in and what page it is on.

We do not mean to suggest, however, that there is no other information in the index. There is a great deal of it. The names of persons, hundreds and hundreds of them—saints, monarchs, artists, authors—are given in the index with their full names and titles, and often their nicknames too, so without sending you any further, the index can give you a certain amount of information about them. For instance, if you want to know Buddha's real name, you will find it in parenthesis after Buddha. Dante's Beatrice is entered under B, but her family name follows.

Geographical names also give you information: that Mount Etna is a volcano and in Sicily and that the Cordilleras are a mountain chain in America. All places, except towns, which are followed by their location only, are given their descriptive term of state, river, lake, etc., as well as the name of the country in which they are found.

Now as to the information in the articles themselves. The index was planned to include all that was worth while. Sometimes a name is indexed even when the article tells very little about it. Suppose only a few lines of text are given to a king. One still learns a good deal about him by looking at him against his background of time and place—his dates, dynasty, relative importance, predecessors, and heirs.

It is simple enough to find specific subjects. If you are interested in moths, turn to M for full information, but if it is only the emperor moth that you are searching for, you will find it under E. Suppose, however, that you want to learn all that you can, not about moths but about insects in general. The search will be even more interesting. Insects, like all main headings, will be in very black type. Then there will be a number of secondary headings such as *bees*, *butterflies*, *mosquitoes*, etc., all of them set a little to the right and arranged alphabetically, one under the other. But before turning to the index to see how the arrangement works keep this in mind:

1—Very black type means three things—the subject or name, the main articles under the subject, and the volume numbers.

2—An asterisk (\*) before the page number refers to a picture and its explanation only, while an obelisk (†) refers to illustrated text.

Though nearly all of the subdivisions in the index are in alphabetical order, there are a few cases in which it has seemed better to use another arrangement. The main article

---

## FOREWORD TO INDEX

---

or most important reference follows the main index entry. Where there is more than one reference of importance immediately following the main entry, they are listed according to their importance. This has been done with dates when there are many historical entries under important countries. But you will see that for yourself

There are four approaches to fact finding in Richards Topical Encyclopedia. Until the reader is thoroughly familiar with these short cuts he should go to the General Index first. Soon, however, he will use the other short cuts, depending upon the kind of information he is seeking. If, for example, he wants to read the complete story of Communication, he simply takes the volume which is stamped on the backbone "Communication." Now, if he wants to read only about the Telegraph, he consults the Contents in the front of the book which indicate the place where the Telegraph article may be found. If, however, he is interested only in the first message telegraphed, he consults the unit page preceding the unit on the Telegraph and finds the exact page where this phase of the subject is discussed

There are countless interesting things an index can help you to find, for instance, which museum will send you pamphlets on Indian customs and crafts. Turn to Indians and run down the list of subentries until you find: customs and crafts, pamphlets about. There you will find the page reference. If you want to know the meaning of foreign terms, such as "café au lait," or the name of the fish that carries bait and light, or the goldsmith who became a patron saint, just look up the words that would naturally occur to you—café, fishing tackle, goldsmiths--and you can get the page number and satisfy your curiosity at once.

Of course you will want to find *puzzles* and *games* and *tricks* and *things to make and do*. They will all come under their own special headings unless it has seemed best to combine two groups, in that case a reference under one will refer to the other. Games, for instance, are under *Sports and games*, a black-type heading that is followed by an alphabetical list of the sports and games by name.

E. W

New York

# INDEX



# INDEX



- A.A.A.**, *see* Agricultural Adjustment Administration
- A B C** powers of South America, 5-515
- A.C. current**, *see* Alternating current
- A.D.**, meaning of, 10-476
- A.E.F.**, *see* American Expeditionary Force
- A E O** light tube, 10-\*506
- A.M.**, abbreviation, 10-472
- A.P.** (Associated Press), 10-79
- Aalesund**, Norway, 6-\*383
- Aard-vark**, anteater, 4-\*454, 456
- Aard-wolf**, 4-709
- Aargau**, canton, Switzerland, annexed to Everlasting League, 6-248
- Aba**, Mohammedan costume, 5-417
- Abaça**, *see* Manila hemp
- Abacus**, architecture, 11-4118
- Abacus**, calculating device, 10-425
- Abalone** shells, 3-1144, 8-40
- Abbasids**, dynasty of caliphs, 5-398
- Abbey, Edwin A.**, paintings, 11-368  
scene from "King Lear," painting, 11-\*365
- Abbey**, 11-87, *see also* Monasteries
- Abbey Theater**, Dublin, 6-161
- Abbot of St. Mary's York**, in story of Robin Hood, 14-354
- Abbotsford**, Scott's home, 13-\*221, †222
- A B C** powers of South America, 5-515
- Abd-el-Aziz**, Wahhabi leader, 5-399, 401
- Abdomen**, anatomy  
color plates, 2-\*278, \*326, \*327  
illustration showing vital organs, 2-\*352
- "Abduction from the Harem, The,"** by Mozart, 12-268
- Abd-ul-Aziz**, *see* Abd-el-Aziz
- Abdullah Ibn Saud**, Wahhabi leader 5-400
- Abdurrahman I**, caliph, 6-320, 321
- Abdurrahman III**, caliph, 6-320
- A Becket**, Thomas, *see* Becket, Thomas à
- Abercrombie, James**, expedition to Fort Ticonderoga, 6-\*79
- Aberdeen**, Scotland, harbor, 6-\*133
- Abilene**, Kansas, 12-555-E
- Abnaki Indians**  
Maine, 8-150  
New Hampshire, 8-238  
Vermont, 8-400
- Abolitionists**, 7-236, 246  
Lowell, 13-312-13  
Whittier, 13-306
- Aborigine**, Australian, 5-\*545
- Abraham**, Hebrew patriarch  
born in Ur, 11-404  
sacrifice of Isaac, 11-\*124, †125  
symbol for heaven, 11-\*89
- Abraham, Heights of**, Quebec  
assault, 6-300; 7-\*11, 12  
Battle of, 1-317; 7-8, \*142
- Abraham Lincoln National Military Park**, Kentucky, 8-158-B; 7-414
- Abruzzi, Luigi A.G.M.F.F.**, Duke of the  
arctic explorations, 13-500  
map of route taken, 13-502 A
- "Absalom and Achitophel,"** by Dryden, 13-174
- Absalon**, archbishop of Lund, services to Denmark, 6-410
- Absaroki Range**, U. S., 8-454
- Abscission layer**, botany, 2-132
- Absolute monarchy**, 7-347, 353  
constitution, 7-356  
Denmark 6-415
- Absolute temperature**, 1-483
- Absolute zero**, 1-358, 515
- Absorber**, of gas refrigerator, 1-\*409, 410
- Absorption of light**, 1-†128
- Abu-Bekr**, first caliph of Mecca, 5-396, 397; 13-523
- Abu Simbel**, Egypt, ancient temple, 11-400
- Abutment**, in arch., 11-\*428
- Abyssinia** (Ethiopia), Africa, description and history, 5-457, 458-61  
animals  
leopard, 4-\*292  
lions, 4-\*288  
monkeys, 4-254  
flag, color plate, 14-following 570, no. 23  
maps, 5-575  
products and industries, 5-461  
coffee, 9-129  
races, 5-445  
trade; exports and imports, 5-461  
transportation, 5-461  
wars with Italy, 6-309, 315; 5-460
- Abyssinia, Plateau of**, Africa, 5-473-A
- Abyssinian church**, 5-460

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

- A.C. current**, electricity, *see* Alternating current
- Acacia**, protection of thorns, 2-205
- "Academic Festival Overture,"** by Brahms, 12-302
- Academies for studying drama**, 12-328
- Academies of art**  
American, 11-362  
British, 11-298  
French, 11-232, 239; *see also* Royal Academy, France
- Academy**, school, Athens, 5-171, 13-7
- Academy of Fine Arts**, Philadelphia, Penn., 8-341
- Academy of Sciences**  
Denmark, 6-415  
founded at Trondheim, Norway, 6-388  
Leibnitz makes plans for, 13-15
- Acadia** (Nova Scotia), Canada, 7-8, 8-151  
made up of maritime provinces, 7-29 L  
named by French, 8-150-A  
refugees settle in Louisiana, 8-142
- Acadia National Park**, Maine, 8-150-A, 7-409
- Acadia University**, Wolfville, N. S., 7-29-N
- Acanthus**, ornament, 11-†425
- Acarnania**, district of Greece, on map, 5-\*150
- Acaulis**, defined, 2-184
- Accad**, *see* Akkad
- Acceleration**, physics, 1-313
- Accelerator center of heart**, 2-378
- Accents**, music, 12-\*214
- Accessory fruits**, 2-122
- Accident prevention**, *see* Public safety
- Accidents**, first-aid, main article, 2-†399-412
- Accolade in knighthood**, 14-\*389
- Accomac County**, Virginia, agriculture, 8-414
- Accordion**, musical instrument, 12-258 C
- Acetate**, rayon, 9-83; 10-553
- Acetic acid**, 9-267, 10-552
- Acetic anhydride**, 10-553
- Acetone**, chemical, 10-553
- Acetylene gas**, 10-392, 553, 9-271-B
- Acetylene lamps**, 10-\*227, 228
- Achaea**, district of Greece, on map, 5-\*150
- Achaean**, people, migration into ancient Greece, 5-152
- Achenes**, fruit group, 2-122, 251
- Acheron**, river in Greek and Roman mythology, 14-407
- Achilles**, Greek hero, 13-28
- Achilles and Ajax playing dice**, 11-†36
- Achilles learning to read**, 11-\*70
- parents**, 12-†29
- Priam and**, 13-\*113
- shield**, 12-348
- Achilles, tendon of**, anatomy, 2-329
- Achromatic lens**, 13-377
- Acids**  
burns, treatment, 2-405  
decomposition caused by, 1-534  
digestive juices, 2-357  
voltaic cell employs, 1-496  
*see also names of acids, as* Citric acid
- Ack-ack**, gun, 10-368 E
- Acoma**, New Mexico, Indian pueblo, 8-255  
Indian stone houses, 7-94
- Aconcagua, Mount**, Argentina, 1-\*26, 5-518-A  
elevation, 1-25  
map, 5-604, F4
- Aconite**, medicine, 9-219
- Acorn shells**, barnacles, 3-†189-91
- Acorns**, 2-\*159  
flour made from, 9-239
- Acoustics**, physics, 1-444
- Acre**, unit of measure, 10-375
- Acrophonic principle in writing**, 10-39
- Acropolis**, Athens, 11-\*419, 5-\*14  
beauty and fame, 11-44  
houses grouped around, 5-169
- "Acropolis Maiden,"** statue, 11-\*39
- Acrylic plastics**, 10-553
- Acrylonitrile**, in synthetic rubber, 9-271-B
- Act of Havana**, 7-56
- Act of Mediation**, Swiss constitution, 6-253
- Act of Settlement**, Ireland, 6-154, 155
- Act of Supremacy**, England, 6-45
- "Acta Diurna,"** Roman publication, 10-73
- Actaeon**, mythology, 14-456
- Actinium**, symbol, atomic no. and wt., 1-\*551
- Actium, Battle of**, 5-226, 12-361
- Activities**, *see* Volume 14
- Actors and actresses**  
18th and 19th centuries, 12-331, 32, 33a  
temper roles taken by women, 12-331  
Greek, costume of, 12-324, 325, 13-33  
masks, 12-324  
miracle plays, 12-327  
moxime-picture, 10-507, 509  
mummers, 12-326  
Oberammergau Passion Play, 12-†328  
professional, early, 12-327  
Restoration, 12-331  
Shakespearean, 12-330, 332  
*See also names of actors and actresses*
- "Acts of the Apostles,"** tapestry, 12-142
- Acts of Trade**, British, 7-159
- Acute angle**, geometry, 10-438
- Acute triangle**, geometric figure, 10-†439
- A.D.**, meaning, 10-476
- "Ad Astra per Aspera,"** motto of Kansas, 8-132
- Adad**, Babylonian god, 5-\*97
- Adalbert, Saint**, missionary in Poland, 6-446
- Adam**, painting of, 11-\*158
- Adam and Eve**, game, 14-169
- "Adam Bede,"** by George Eliot, 13-261
- Adam brothers** (James and Robert), architects and furniture designers, 11-503; 12-\*191-92, 194
- "Adamant,"** origin of word, 9-431
- Adams, Abigail Smith** (Mrs. John Adams), as First Lady, 12-559  
gown worn by, 9-\*15
- Adams, Charles Francis**, 12-481
- Adams, Henry**, 12-481

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



- Adams, John**, president of the U. S., life, main article, 12-†479-80, 456-B  
 administration, 7-198  
 conference with Lord Howe, 12-†479  
 death, 12-480  
 Hamilton's relations with, 12-510, 7-198  
 Marshall appointed chief justice by, 7-226  
 portrait, 12-†480  
 vice-presidency, 12-456-F
- Adams, John Couch**, discovers Neptune, 1-158
- Adams, John Quincy**, president of the U. S., 12-456 B, 481  
 and Cherokee Indians, 7-226  
 birthplace, 8-174  
 election, 7-222
- Adams, Léonie**, poet, 13-353
- Adams, Louisa Catherine Johnson** (Mrs. John Quincy Adams), 12-562
- Adams, Maude**, in Barnum's plays, 13-268
- Adams, Moses N., Mrs.**, 8-198-A
- Adams, Samuel**, 7-161, 12-480
- Adams, Will**, in Japan, 5-354-356
- Adams County**, Ohio, Serpent Mound, 8-304
- Adams family**, main article, 12-479-81
- Adams Memorial**, Washington, by St. Gaudens, 11-†37
- Adam's Peak**, mountain, Ceylon, 5-387-B
- Adaptation in biology**  
 plants, 2-†187-90, †203-7  
*see also* Hibernation; Migration; Protective devices of animals
- Addams, Jane**, biography, main article, 12-580-81  
 portrait, 12-†580
- Addax antelope**, 4-†417
- "Adder,"** change in spelling of term, 10-22
- Adders**, snakes, 3-†489-90, †482
- "Adding Machine, The,"** drama by Elmer Rice, 13-355
- Adding machines**, 10-†425-26  
 Pascal's, 13-108
- Addis Ababa**, capital of Abyssinia, 5-461  
 military camp, 6-†498
- Addison, Joseph**, life and works, main article, 13-†180-82  
 and Steele, 13-180-181  
 portrait, 13-†180
- Addition**  
 algebra, 10-434  
 arithmetic, 10-429
- Addra**, gazelle, 4-†420
- Adelaide**, Australia, 5-544, 552
- Aden**, Arabia, English protectorate over, 5-401  
 coaling station, 10-237
- Aden, Gulf of**, between Africa and Asia, maps, 5-576, 580
- Adhesion**, physics, 1-†359, 360
- Adhesives**, corn yields, 10-547
- Adirondack Mountains**, N. Y., 8-264  
 map, 7-595
- Adirondack Park**, 8-284-A
- "Adjustment of Conflicting Interests,"** painting, 7-†357
- Adjutant stork**, bird, 4-†193
- Adler Planetarium**, Chicago, Ill., 1-†190
- Admetus and Alcestis**, in Greek myth, 14-454
- Admiral, White**, butterfly, 3-276
- Admiralty bear**, 4-†316
- Admiralty Islands**, Pacific Ocean, map, 5-597
- Admission Day**, holiday in Arizona, 8-24-A
- Adobe**, building material, 9-376, †378
- Adobe houses**, 7-43; 8-255
- Adolphus of Nassau**, Holy Roman emperor, 6-209
- "Adonais,"** by Shelley, 13-229
- Adonis and Venus**, 14-442
- Adoption of children**, 7-441
- Adoration of the Magi**  
 Botticelli's painting, 11-†122, 147  
 Jan Mabuse's painting, 11-†201  
 van der Weyden's painting, 11-200  
 van Ghent's painting, detail, color plate, 11-†360
- "Adoration of the Wise Men,"** painting by Signorelli, 11-†141, 143
- Adrenalin**, hormone, 2-361, 377  
 medicine, 10-550
- Adrianople**, division of Turkey, conquered by Turks, 5-411
- Adriatic Sea**, arm of Mediterranean Sea  
 Italian coast, 6-315-B  
 maps, 6-587, 588, 570  
 once dry land, 3-61  
 Venice wedded to, 11-449
- Adventitious buds**, 2-133
- Adventitious roots**, 2-†35
- Adventure on seas**, age of, 10-167
- "Adventures of an Atom,"** novel by Smollett, 13-191
- Adverb game**, 14-156
- Advertising**  
 Barnum's methods, 12-†578, 579  
 newspapers, 10-79  
 radio, 10-†1-1-F
- Aeëtes**, king of Colchis, 14-450
- A.E.F.**, *see* American Expeditionary Force
- Aegean architecture**, 11-†415-17
- Aegean civilization**, 11-415-17  
 map, 5-†48  
*see also* Crete, ancient; Homer, Mycenae; Tiryns, Troy
- Aegean Sea**  
 islands, 6-477  
 maps, 6-595, 571  
 once dry land, 3-61  
 origin of name, 14-448
- Aegeus**, Athenian king, 14-447, 448
- Aegina**, island, Greece, temple carvings, 11-†40
- Aegisthus and Clytemnestra**, Greek characters, 14-†452
- Aelst, Peter van**, tapestry by, 12-142
- Aeneas**  
 Dido and, 14-†433  
 hero of Virgil's "Aeneid," 13-48  
 Julius Caesar descended from? 12-356  
 parents, 14-450

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Aeneas—continued**

- Rome founded by, 5-204
- sculpture by Bernini, 11-<sup>\*</sup>183
- sibyl of Cumae and, 5-207

"**Aeneid**," of Virgil, 13-48; 5-229

**Aeniania**, district of Greece, on map, 5-<sup>\*</sup>150

**A E O** light tube, 10-<sup>\*</sup>506

**Aeolian harp**, 12-203

**Aeolus**, god of the winds, 14-434

- statue by Gianda Bologna, 11-<sup>\*</sup>169

**Aepyornis**, bird, 4-237

**Aërator**, of Ashokan Reservoir, 10-<sup>\*</sup>551

**Aërial**, radio, 10-<sup>\*</sup>115, 116, †121-(O)-21-P, <sup>\*</sup>121-V

- radar antenna, 1-<sup>\*</sup>567

**Aërial photography**, 10-452

**Aërial roots**, 2-38

**Aerie**, eagle's nest, 4-152

**Aëronautics**, *see* Aviation

**Aeroplane**, *see* Airplane

**Aeschylus**, life and works, main article, 13-†32-34

- adds actor to stage, 12-324

- portrait bust, 13-<sup>\*</sup>34

**Aesculapius the healer**, statue, 11-<sup>\*</sup>66

**Aesop**, life and works, main article, 13-†41-43

- animals of, 1-47

- "Fables," 13-41, 42

- La Fontaine's version, 13-115

- retold, 14-†255-308

- Velasquez's painting of, 13-<sup>\*</sup>42

**Aesop's Fables Retold**, 14-†255-308

**Aethelred I**, king of Wessex and Kent, aids Alfred, 5-311

**Aetolia**, district of Greece, on map, 5-<sup>\*</sup>150

**Afferent nerve**, 2-395

**Affinity**, chemistry, 1-545

**Afghan hound**, 4-<sup>\*</sup>490

**Afghanistan**, description and history, 5-†433-35

- climate, 5-435

- control in Turkestan, 5-435

- flag, color plate, 14-following <sup>\*</sup>572

- government, 5-434, 435

- maps, 5-585, 580

- people, 5-434

- in India, 5-379, 385

- trade, 5-433

- under Indian empire, 5-371

**A.F.L.**, American Federation of Labor, 7-561, 563, 283, 309

**Africa**, continent, **description and history**, main article, 5-†442-91; general data, 5-473-A-473-B (*see also* Contents Volume 5) and World War II index, 6-493

**agriculture**

- East Africa, 5-461, 462, 464

- North Africa, 5-452, 453, 455

- products, 5-473-B

- South Africa, 5-<sup>\*</sup>490

- West Africa, 5-468, 470, 471, 472, 473

**animals**, 5-444, <sup>\*</sup>445, 473-B

- big game hunting, 5-458, 461

**Africa, animals—continued**

desert, 5-453

South Africa, 5-475

Arabs, 5-†450-54

area and location, 5-473-A

Barbary Coast, 5-†450-55

canals, *see* Suez Canal

cannibalism, 5-446, 467

climate, 5-443, 457, 473-A, 475

Congo country and its people, 5-†467-70

costumes, native, 9-<sup>\*</sup>4, <sup>\*</sup>21

**description and history**, 5-†442-91

East Africa, 5-†451-64, 473-A

Egypt, 5-†47-73

North Africa, 5-†451-55

South Africa, 5-†475-91, 491-B

West Africa, 5-†467-73

desert, *see* Sahara Desert

divisions, 5-473-B

- political divisions and European ownership, 5-<sup>\*</sup>444, 448, 451 fol., 457, 461, 468 fol.

- map showing, 5-<sup>\*</sup>444

explorations

- early, 5-446, 448

- first vessels to sail down coast, 5-446; 10-167

- Livingstone's, 13-552-54

- Portuguese, 7-113; 5-476, 460, 464

- Centa taken, 6-340

- Congo sighted, 5-468

- Diaz, 13-456

**highest and lowest altitudes**, 1-25

hunting, 5-458, <sup>\*</sup>460

independent states, 5-448

industries, *see below*, products and industries

jungles, 5-467, 472

lakes

- Nyasa, 5-462, 13-553

- Tana, 5-461

- Tanganyika, 5-464

- Victoria, 5-462

languages, 5-473-B

Livingstone in, 5-461, 468; 13-551-54

maps

- Central and Southern Africa, 5-577

- Egypt, Ethiopia, and N.E. Africa, 5-578

- Northern Africa, 5-574

- on map of World, 5-573

- showing importance of Suez Canal, 10-<sup>\*</sup>166

- territorial ownership, 5-<sup>\*</sup>444

masks, 12-96, <sup>\*</sup>98

minerals, 5-473-B

musical instruments, 12-<sup>\*</sup>223, <sup>\*</sup>226

- native drum, 12-<sup>\*</sup>202

musicians, native, 12-<sup>\*</sup>207

Negro carvings and masks, 12-96, <sup>\*</sup>98

Negro life and customs, 5-<sup>\*</sup>443, †445-48

- 457-63, 466-73, <sup>\*</sup>475-81

- drums used for signaling, 10-30

- filing of teeth, 2-<sup>\*</sup>315

people, 5-473-B; *see also* races *below*

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Africa** — *continued*

physical features, 5-444, 473-A  
 East Africa, 5-457, 461, 462  
 mountains, 1-29  
 North Africa, 5-452-53  
 South Africa, 5-473  
 West Africa, 5-467, 470, 471, 473  
 pignies, 5-445, 467, \*468-70  
 piracy, 5-454; 9-206; 13-76  
 dispute over Morocco, 6-234  
 Dutch colonies, 5-476-79  
 Italian colonies, 6-309  
 pottery, 12-\*41  
 prehistoric land formation, 3-61  
 products and industries, 5-473-B  
 chocolate, 5-471, 473, 9-177  
 coal, 5-461  
 cochineal bies raised for dye industry, 9-305  
 copper, 5-461; 9-419  
 cork, 9-296  
 East Africa, 5-461, 462  
 gold, 5-461, \*488; 9-393  
 ivory, 5-\*466  
 mines, 5-464, 468, 490  
 diamond mines, 5-485, 491 B, 9-429, 430  
 gold, 5-461, 9-\*391  
 North Africa, 5-453, 455  
 palm oil, 9-190  
 pitchblende, 9-426  
 rubber, 5-472; 9-267  
 silver, 9-389  
 South Africa, 5-490  
 West Africa, 5-468, 470, 471, 472, 473  
*see also* Africa, agriculture  
 races, 5-445  
 classification, 5-43  
 East Africa, 5-458, 462  
 North Africa, 5-451, 453  
 West Africa, 5-472, 473  
 religion, 5-473 B  
 Christianity, 5-460, 13-533  
 Mohammedanism, 5-416, 451, 454, 458, 472  
 rivers, 5-444, 452, 461, 470; 10-267  
 Congo, 5-467  
*see also* Nile River  
 seaports and trade, 10-235  
 shelter, 1-\*196; 5-\*458, \*479, \*489; 9-\*377;  
 11-\*399; 12-\*129, 130  
 slave trade, 5-448, 455, 468, 470  
 exposed by Livingstone, 13-552, 554  
 slaves, freed, colonies for, 5-470  
 stories and tales about, 5-446  
 transportation and communication  
 animals used, 10-\*133  
 boats, 10-\*140  
 desert, 5-454, 473  
 railways, 5-454, 464; 10-185  
 river, 5-144, 468, 473; 10-267  
 vegetation, 5-473-A  
 Victoria Falls, 5-461, \*486; 13-553  
*see also* political divisions, as Egypt; South  
 Africa

"African, The," opera by Meyerbeer, 12-253  
 African Association, 5-453  
 African oil palm, 9-189, 190, 191  
 African wood ibis, bird, color plate, 4-184  
 Afrikaans, language of South Africa, 5-491  
 Afrikanders, people, 5-477  
 After damp, in coal mines, *see* Fire damp  
 "Afternoon of a Faun, The," ballet by Debussy,  
 12-318  
 Agamemnon, Greek leader  
 excavations for tomb, 5-17  
 in Trojan War, 13-28, 33  
 sacrifice of Iphigenia, 14-456  
 slaying, 14-\*452  
 "Agamemnon," Nelson's ship, 12-421  
 "Agamemnon," ship, Atlantic cable laid by,  
 10-104, \*105  
 Agaña, capital of Guam, 8-465  
 Agaricus, mushroom, 2-76  
 Agassiz, Louis John Rudolph, biography, main  
 article, 13-\*431-33  
 earth's temperature measured by, 1-32  
 Ice Age theory, 1-59, 61  
 lake named after, 9-190  
 portrait bust, 13-\*432  
 "Agassiz," Canadian corvette, 7-29-E  
 Agassiz, Lake, an Ice Age lake, 1-61; 8-190  
 bed of, 8-298  
 Age of Faith (Middle Ages), 12-182  
 "Age of Innocence, The," by Edith Wharton,  
 13-346  
 "Age of Innocence, The," painting by Sir Joshua  
 Reynolds, 11-\*297, 298  
 "Age of Iron, The," painting, 5-\*114  
 "Age of Pericles," painting, 12-\*342  
 Age of Pericles, *see* Pericles, Age of  
 Age of Reason (Age of the enlightenment)  
 England, 6-75  
 France, 6-185; 13-120  
 Agglutinin, formed by blood, 2-350  
 Agincourt, Battle of, 6-35, \*36, 174  
 Aglaia, one of Three Graces, 14-411  
 "Agnes Gray," by Anne Bronte, 13-248  
 Agony in the Garden, portrayed in paintings by  
 Mantegna and Bellini, 11-175  
 Agouti, animal, 4-\*379  
 snake an enemy, 3-489  
 Agravaine, Sir, in Arthurian romances, 14-400  
 Agricola, Tacitus' life of, 13-56  
 Agricultural Adjustment Administration, 7-  
 341-B  
 Agricultural chemistry, 10-545  
 Agriculture, main article, 7-\*450-63  
 4-H clubs, 7-457, \*456; 9-\*144  
 agricultural products  
 cereals, 9-\*118-20  
 corn, 9-\*104-6  
 from the garden, 9-\*147-54  
 peanuts, 9-\*108-99  
 potatoes, 9-\*142-45  
 rice, 9-\*108-11  
 soybeans, 9-214, 214-B

**Agriculture, agricultural products—continued**  
 tobacco, 9-†221-24  
 wheat, 9-†97-102  
*see also* Contents Volume 9 and Fruits and fruit growing  
 American Indians, *see* Indians, American, *subhead* agriculture  
 aviation's services, 10-322  
 Balkans, 6-†361, \*362, \*365  
 bees and bee hives, 3-†309, †311 fol., 318  
 beginnings, 5-†32, 34, 35; 7-450  
 by-products, *see* By-products  
 California's gigantic industry, 8-39  
 census of, 7-379  
 chemical knowledge used in, 10-545-46; 1-†537  
 chemical industry absorbs surplus, 10-546  
 China, 5-†316  
 climate and rainfall, 1-195-96, 237, \*252, 254  
 conservation essential, 7-465 fol.  
 contour planting, 9-†26  
 coöperative societies, 7-460, 10-531  
 cotton, importance of, 9-29  
 crop rotation, 7-463; 1-538  
**dairying**, 9-331-38  
 dependence upon industry, 7-†573  
 depression following World War I, 8-301  
 difference in farm and garden crops, 9-147  
 double-cropping, 9-154  
 dry farming, 7-455  
 education in, 7-†456, 457  
   oldest college, 8-183  
 effect of crops on prices, 8-121  
   cotton, 9-29  
 experimental stations, 7-456  
 extensive farming, 7-461  
 fallow land, 10-546  
 farmers oppose Big Business, Populist party, 7-291-92  
 fertilizers, 10-545-46; 7-454, 9-153  
 financial distress of farmers, 7-459  
 frost hazard, 1-237; 9-163, 174  
 government measures to aid farmers, 7-378, 380, 456, 459, 316, 343, 470  
 growing season, 1-211; 2-256  
 insect and fungus killers, 10-546; 9-†33-34  
 intensive farming, 7-461; 9-152 fol.  
 interdependence of manufacturing industries and agriculture, 7-569  
**irrigation and reclamation**, 10-†528-33; 5-557; 6-352; 7-†310  
   Bureau of Reclamation, 7-460, 10-531  
 land values decline following war, 7-458  
 live stock, 7-453, 461, 463  
 machinery, 7-452  
   corn picker and husker, 8-†105, \*128  
   cotton gin, 10-†404-7; effect of, 10-530; 7-†280  
   cranberry picker, 9-†157  
   cultivators, 9-†26, \*105, \*115  
**harvesting**, 10-†409-13; 9-†100, 101, \*105, \*531, \*533, 142  
   threshing, 6-†361; 9-†118

**Agriculture, machinery—continued**  
 plows, 5-†32, 35; 8-†425  
 tractor and drill, 9-†98  
 weed cleaner, 7-†455  
 Middle Ages, 5-302, \*303  
 New Stone Age, 5-†32, 34, 35  
 number engaged in industry, U. S., 7-468  
**pests**, 2-†136-41; army worm, 3-373  
   boll weevil and boll worm, 9-†33-34  
   locust plagues, 3-†368 fol.  
**poultry raising**, 9-350-59  
 primitive threshing methods, 5-†472  
 roadside marketing, 9-151  
 seasonal nature, 9-154  
 services of birds to, 4-9  
 sharecroppers, 7-459  
**sheep**, 9-†74-81  
 silos, 9-†331  
 soilless farming, 9-154  
 tenant system of farming, 7-459; 8-203  
 tools, 7-452  
 truck farming, 9-†148; †150-54  
 United States, *see subhead* agriculture under United States and under names of states  
 Weather forecasting important to, 1-278  
*see also* Farmer, Farms and *subhead* agriculture under names of countries and states and also various farm products and industries, as Fruits and fruit growing, Poultry  
**Agriculture, Department of**, U. S., 7-378, 380, 456  
   4 H clubs, 7-457  
   Bureau of Biological Survey, 4-516  
   cellulose waste studied by, 9-294  
   crop inspectors, 9-144  
   experiment stations, 7-456, 380, 8-465  
   help by other agencies, 7-470  
   search for new food plants, 9-150  
   services to farmers, 7-316, 380  
   Soil Conservation Service, 7-470  
   supervises soil conservation, 7-470  
   wheat experiments, 9-100  
**"Agriculture and Commerce," motto of Tennessee**, 8-374  
**Agrippa, Marcus**, Roman statesman, 12-363  
**Agrippina**, mother of Nero, 5-†233  
**Aguacate**, alligator pear, 9-104  
**Aguascalientes**, state, Mexico, map, 7-596  
**Agualdo, Emilio**  
   leads revolt against Spain, 5-568, 569  
   rebellion against United States, 7-298  
**Agusan**, river, Philippine Islands, 5-570  
**Ahab**, king of Israel, 5-124, 125, †126  
**Ahiram**, *see* Hiram, king of Tyre  
**"Ahmed, Prince, Story of,"** fairy tale, text, 14-†251-53  
**Ahmed I**, sultan of Turkey, mosque of, 5-†403  
**Ahmedabad**, India, beautiful buildings, 5-†380  
**Ahmose I**, Egyptian ruler, 5-61  
**"Ahnighito,"** meteorite, 1-†166  
**Ahriman**, Persian spirit of evil, 5-102; 13-12  
**Ahuehete**, Mexican tree, age, 2-260

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Ahuramazda** (Mazda), Persian spirit of good, 5-102
- Ai**, sloth, 4-453
- "Aida,"** opera by Verdi, 12-300, 253
- "Aiglon, L',"** play by Rostand, 13-137
- Aigrettes**, plumes, 4-1140, 1146
- Aiken, Conrad**, poet, 13-352
- Aiken, Walter B.**, composer, 8-206-A
- Ailerons**, of airplane, 10-\*328-K, 328-N
- Aimara**, Indian language, 5-518-B
- Ainu**, race, Japan, 5-336 C, 1340, 359
- Air, nature of**, main article, 1-1216 20  
 atmospheric levels, 1-218  
 automobile fuel mixed with, 10-1283-84  
 becomes liquid, temperature, 1-\*392  
 composition, 1-219, 1374  
 compressed, 1-460-62  
 decomposition, 1 533  
 dust in, 1-219  
 effect of plants on purity, 2-50  
 electricity conducted by, 1-514  
 expansion and contraction, 1-\*481, 483  
 fresh, necessary to skin, 2-341, 342  
   in room, 10-384  
 Greece effect of moon, art, 11 38  
 height, 1 218  
 helps cause explosions, 10 418  
 humidity, 1 240  
 in Anaximenes' theory of world, 13 2  
 in tunnel, 10-203  
 life dependent on, 1 219, 373  
 light diffused by, 1-140, 175, 176, 220  
 liquid air, 1-1405  
 necessary for mined, 2 400  
 necessary for combustion, 1-4, 384, 385  
 nitrogen in, 1-1374, 538  
 poor conductor of heat, 1-397  
 pressure, *see* Atmospheric pressure  
 retraction of light, 1-\*424 26, 427, \*431  
 resistance, 1-295, 319  
   cause of airplane's rise, 10-315, 328  
   lack of on moon, 1-139, 140, 141  
 respiration, 2-336  
 source of food for plants, 2-41, 43, 45  
 speed of air molecules, 1-359  
 speed of sound through, 1-1445, 1446  
 ventilation important to health, 10-384  
 water vapor, 1-219, 241  
 why hot air rises, 1-397, 1398, 483  
 why solids float in, 1-1467-70, 471 *fol.*  
*see also* Atmosphere, Compressed Air
- Air**, kingdom, in Sahara Desert, 5-453
- Air bladder**, of fish, 3-\*233, 245
- Air brakes**  
 invented by Westinghouse, 10-196  
 operation, 1-1461, 462
- Air conditioning**, 1-409, 10-385-85-A, 519
- Air cooling**  
 automobiles, 10-1286  
 buildings, 10-519
- Air currents**, main article, 1-1222-25  
 convection currents, 1-399
- Air-mail service**, 7-378; 10-91, \*92
- Air manifold**, Diesel engine, 10-\*276
- Air passages**, anatomy, 2-336, \*337
- Air plants** (epiphytes), 2-38, 1150
- Air pressure**, main articles, 1-1452-65  
 appliances and devices operated by, 1-1458-65  
 demonstrations, experiments, 1-1452-56  
 Magdeburg Hemispheres, 1-\*452, 453  
*see also* Atmospheric pressure
- Air pumps**, 1-465
- Air sacs** (alveoli) of lungs, 2-334, 1336 *fol.*
- Air Service**, U. S., *see* United States, Air service
- Air thermometer**, 1-\*389, 1390, 391
- Aircraft**, main article, 10-1312-28  
 Leonardo da Vinci's plans, 10-314, \*315; 11-151  
 ocean landing stages, 10-\*325  
 islands valuable for, 6-483, 489  
*see also* Airplanes; Airships; Balloons; Dirigibles; Gliders
- Airedale terrier**, 4-1493
- Airplanes** main article, 10-1312 28; 7-\*577  
 Air Force, 7-1479-F-481; 10-\*368-C, D, S  
 airliner, 10-1321 *fol.*; 7-\*577  
 aluminum used in, 9-422  
 bombers, 10-\*368-C-68 F, 7-\*479-F, \*480  
 carrier, 7-485, \*487; 10-\*366  
 construction, 10-1315, 317, 328-H-328-K  
 cotton fields dusted by, 9-133  
 DC-6, passenger plane, 10 326  
 diagram, 10-1328 N, 328 K, \*321  
 early machines, 10-\*316, 317  
 engine, 10-315, 317, 328-J-28-K  
 famous flights, 10-318, 320, \*322, 324, 327  
   polar flights, 13-501-2, 510, 512, 10-\*324  
 fighters, 10-1368-C-68-F; 7-\*480  
 fuel, 9-456  
 gliders, 10 \*315-16, 317, 368 F  
 gyro used in, 1-291  
 jets and rockets, 10-1328-S-V, \*368-C; 7-\*480  
 Mach number, 10-1328 S  
 mail carriers, early, 10-\*92  
 markings and what they mean, 10-1312  
 Navy planes, 7-487-88-A, 10 \*368-C  
 parachute, 10-1320, 363  
 parts, 10-\*328-K  
 photography, 10-452  
 principles upon which operated, 10-1315 *fol.*  
 pursuit, 10-\*368 C-368-F  
 radar, use of in landing, 1-567  
 service to South America, 5-517  
 smoke screen laid by, 10-\*364  
 stream-lining, 10-\*315  
 supersonic flight, 10-\*328-S  
 transports, 10-\*368-D  
 types, 10-\*328-K  
 voyage in the air, 10-1328 *fol.*  
 World War I, 10-318, 364
- Airports**  
 La Guardia, 7-\*577  
 Lakehurst, N. J., 8-246

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Airports—continued**

- Newark, 8-249
- seadrome, 10-\*325
- Airships**, 10-314, \*316, \*324
  - gases used to inflate, 1-473; 10-314
  - helium, 1-375, 377, 547; 10-314
  - "Hindenburg" disaster, 10-\*318
  - manufactured at Akron, Ohio, 8-312
  - see also* Dirigibles
- Airways**, 10-322
- Airy, Sir George**, 1-158
- Aix-la-Chapelle**, Charlemagne's capital, 11-84
- Aix-la-Chapelle Cathedral**, 11-\*461
- "Aja, Frau,"** Goethe's mother, 13-281
- Ajaccio**, port of Corsica, 6-472
- "Ajax,"** by Sophocles, 13-36
- Ajax and Achilles playing dice**, painting on vase, 11-†36
- Ajax and Odysseus**, Greek painting, 11-36
- Akbar**, Mogul emperor, 5-374
  - negotiations with Portuguese, 5-378
  - plants mango trees, 9-194
- Akhetaton**, ancient Egyptian capital, building of; art, 11-16, 17
- Akkad**, dist., Mesopotamia, location, 5-80
  - map, 5-\*76
- Akron, Ohio**, rubber industry, 8-\*309, 312; 9-271
- "Akron,"** dirigible, 10-315
- Alabama**, state, U. S., main article, 8-†1-7;
  - general data, 8-8-8-B
  - agriculture, 8-1
  - area, 8-8
  - charities and correction, 8-8
  - cities, towns, list, 8-8-A, 8-B
  - climate, 8-8, 1
  - constitution, 8-8
  - counties, list, 8-8-A
  - education, 8-7
  - educational institutions, 8-8
  - flag, 8-8-A
  - history, 8-4, 6-7
  - holidays, 8-8-A
  - Indians, 8-6; 7-\*101
  - location, 8-8
  - map, 8-473
    - on United States map, 7-595
  - motto, 8-8-A
  - name, origin of, 8-8-A
  - national forest area, 8-8-A
  - nicknames, 8-8-A
  - parks, 8-8-A
  - physical features, 8-8, 2
  - political facts, 8-8
  - products and industries, 8-3 fol.
    - along Coosa River, 8-2
    - cotton, 8-1, 4
    - Mineral Belt, 8-3, 4
    - Timber Belt, 8-4
  - see also* Alabama, agriculture
  - reservations, game and bird, 8-8-A
  - rivers, 8-8, 2
  - state bird, 8-8-A

**Alabama—continued**

- state flower, 8-8-A
- state song, 8-8-A
- transportation, 8-4
- trade, 8-3
- water surface, 8-8
- water power, 8-3
- Alabama, University of**, Tuscaloosa, Ala., 8-†2, 7
- Alabama, or Alabamu Indians**, 8-8-A
- Alabama River**, U. S., 8-8, 2
  - length, 10-255
- Alabaster**, 1-54
  - Assyrians' use of, 11-27
  - use in basilicas, 11-442
- "Aladdin and His Wonderful Lamp,"** fairy tale, text, 14-†371-76
- Alais, Lady**, and King Richard, 12-373
- Alamance Creek**, scene of Regulators' defeat, 8-291
- Alameda de las Delicias**, Santiago, Chile, 5-\*518
- Ajamo** (San Antonio Mission), 8-378, †380
  - defense of, 8-380; 7-†235
- Alamo tree**, Spanish for cottonwood, 8-378
- Alan-a-Dale**, in story of Robin Hood, 14-356
- Aland Islands**, Gulf of Bothnia
  - map, 6-597
  - transferred from Sweden to Russia, 1809, 6-407
- Alard**, violin, 12-225
- Alaria**, alga, 2-\*68
- Alaska**, territory, U. S., description and history,
  - main article, 8-10-15; general data, 16-16-B
  - aërial survey, 7-488
  - agriculture, 8-13
  - animal life
    - bears, 4-\*312, 313, \*319
    - birds
      - bald eagle, 4-151
      - crossbill, 4-130
      - emperor goose: Bering Sea Region, 4-120
      - gulls, 4-202
      - kinglet, 4-225
      - longspur, 4-130
      - ptarmigan, 4-229
      - sanctuary, 4-517
      - shrike, 4-229
    - foxes, 4-\*305
    - seals, 4-327 fol.
  - area, 8-16
  - baskets made from fir roots, 12-129
  - boundary dispute, 7-28; 8-14
  - capital, 8-16
  - charities and correction, list, 8-16-A
  - cities, towns, list, 8-16-B
  - climate, 8-16-A, 10
  - communication, 8-15
  - discovery; Russian control, 8-11
  - districts list, 8-16-B
  - education, 8-15
  - glaciers, 8-16; 1-\*59, 64
  - gold rush, 8-13; 9-393

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Alaska—continued**

government, 8-16-A, 15  
 ice field, 1-197  
 Indians, 7-98, \*102, \*106  
 industries, *see below* products and industries  
 location, 8-16  
 map, 8-560  
   on map of North America, 7-590  
   size compared with U. S., 8-\*13  
 modern progress, 8-15  
 monuments, 8-16-A  
 name, 8-16-B  
 parks, 8-16-A; 7-407  
 people, 8-10, 11; *see also* Eskimos; Indians  
 physical features, 8-16, 10, 15  
 population, 8-15  
 products and industries, 8-13-14  
   fisheries, 8-14; 9-\*367, \*368  
   fur trade, 8-11, 14  
   reindeer raising, 8-\*12  
   salmon canning, 8-368  
 purchased by U. S., 8-12  
 reservations, game and bird, 8-16-B  
 rivers, 8-16  
 seaports, 10-242  
 totem poles, 8-11, 12-196  
 trade, 10-242  
 transportation, 8-15  
 Valley of Ten Thousand Smokes, 7-417  
 volcanoes, 1-76  
**Alaska, Gulf of**, map, 8-561  
**Alaska longspur**, bird, 4-130  
**Alaska Peninsula**, Alaska, 8-16  
   map, 8-560  
**Alaska Railway Muskrat and Beaver Refuge**,  
   8-16-B  
**Alaskan brown bear**, 4-\*312  
**Alaskan Range**, mts., Alaska, map, 8-560  
*Alatus*, defined, 2-184  
**Alb**, church robe, 12-164  
**Albania**, country, Europe, description, 6-366  
   agriculture, 6-366  
   flag, color plate, 14-following 570, no. 2  
   map, 6-595  
   people, 6-\*364, †366  
   physical characteristics, 6-366  
**Albania**, Hudson River region, 8-284-A  
**Albans**, people, struggle against Romans, 5-206  
**Albany**, N. Y., 8-281  
   bought from Indians, 7-\*130  
   capitol building, 8-\*264  
   early fur trade, 7-7  
   Peter Schuyler leader of early colony, 8-275  
**Albany, Fort**, 8-274  
**Albany Plan for union of the states**, 12-466  
**Albany River**, Ontario, Canada, length, 10-253  
**Albatross** (Wanderer), sea bird, 4-†215-17  
**Albedo**, defined, 1-147  
**Albemarle Point**, S. C., early colony, 8-350  
**Aberich**, king of the Nibelungs, 14-\*311  
**Albert I**, Holy Roman emperor, 6-209  
**Albert II**, Holy Roman emperor, 6-211

**Albert Francis Charles Augustus Emmanuel**,  
 Prince of Saxe-Coburg-Gotha, consort of  
 Queen Victoria, portrait, 6-\*101  
**Albert**, Archduke of Austria, association with  
 Rubens, 11-220, 222  
**Albert** (Achilles), elector of Brandenburg, 6-\*218  
**Albert of Mecklenburg**, called to Swedish  
 throne, 6-396  
**Alberta, province, Canada**, 7-29-T, 33-A, 33-B  
   enters Canadian federation, 7-28  
   map, 7-592  
   national parks, 7-29-V  
**Albino rabbit**, 4-\*388  
**Albino squirrel**, 4-365  
**Alboin**, Lombard king, 6-294  
**Albumen in egg**, 9-356  
**Albuquerque, Alfonso de**, 5-378  
**Albuquerque, New Mexico**, 8-261  
   university, 8-255  
**Alcan Highway**, (Alaska-Canada), 7-29-F,  
   29-U, 29-X, \*29-G; 10-156  
**Alcatraz**, island in San Francisco Bay, 8-43  
**Alcazar**, palace-fortress, Segovia, Spain, 6-\*317  
**"Alcestis"**, drama by Euripides, 13-38  
**"Alcestis"**, opera by Gluck, 12-272  
**Alcestis and Admetus**, in Greek myth, 14-454  
**"Alchemist, The,"** by Ben Jonson, 13-†164  
**Alchemy**, 1-282; 13-164  
   contributions to modern chemistry, 10-544  
   laboratory, 1-\*532; 13-†164  
**Alcibiades**, Greek general, 5-173; 13-\*5  
**Alcmaeon**, Greek natural philosopher, 13-4  
**Alcock, John**  
   flight across Atlantic, 10-320, 325  
   portrait, 10-\*327  
**Alcohol**  
   boiling point, 1-\*392  
   effect on driving, 2-435  
   freezing point, 1-213  
   made from, 7-453; 9-144, 271-A  
   Mohammed forbids use of, 5-418  
   products, 10-547  
   specific gravity, 1-474  
**Alcohol thermometer**, 1-207, 390  
**Alcott, Amos Bronson**  
   Fruitlands experiment, 13-320  
   member of Transcendental Club, 13-305  
**Alcott, Louisa May**, *life and works*, main article,  
   13-†319-21; portrait, 13-\*320  
   home at Concord, Mass., 13-\*320  
**Alcyonaria**, coral, 3-102  
**Alcyone**, Greek mythology, 4-50  
**"Alcyone,"** poems by Lampman, 13-577  
**Aldebaran**, star, star maps:  
   Jan. and Feb., 1-178-B  
   Nov. and Dec., 1-178-L  
   Sept. and Oct., 1-178-I  
**Alden, John**, house in Duxbury, Mass., 11-\*497  
**Alder flycatcher**, 4-43  
**Aldermen, Board of**, 7-392  
**Alderney**, island, English Channel, 6-488  
**Alderney cows**, 6-488

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Aldine Press**, 10-51  
**Aldini**, lays cable under the Marne, 10-102  
**Alekhhine, Alexandre**, chess player, 14-490  
**Alekseyev, Constantin Sergeyevich**, *see* Stanislavsky  
**Alemanni**, Germanic people, 5-268  
   defeated by Clovis, 5-\*290, 291  
   occupy Helvetia, 6-246  
**Alembert, Jean le Rond d'**, Encyclopedia, 13-120  
**Alençon**, France, lacemaking, 12-172  
**Alenuihaha Channel**, Hawaiian Islands, map, 8-562  
**Aleppo galls** (oak apples), ink made from, 9-\*304, 307  
**Alesia**, ancient Gaul, metal work, 12-6  
**Alessandria**, Italy, fortified town, 5-298  
**Aleut Indians**, "Alaska" derived from language of, 8-16-B  
**Aleutian Island Bird Refuge**, 8-16-B  
**Aleutian Islands**, Bering Sea, 8-16  
   charitable institutions, 8-16-A  
   climate, 8-16-A  
   game hunting, 8-11  
   map, 8-560  
   sunken mountain peaks, 1-27  
**Alexander III**, pope, and Frederick I, 5-298  
**Alexander VI**, pope, 5-†137; 6-\*300, 302  
   divides Spanish and Portuguese territory in New World, 7-119  
   portrait, 5-\*137  
**Alexander I**, czar of Russia, 6-434  
   relations with Napoleon, 6-†434  
   sets up Congress Kingdom in Poland, 6-454  
   treatment of Finns, 6-456  
**Alexander II**, czar of Russia, 6-436  
**Alexander III**, czar of Russia, 6-437, 438  
**Alexander II**, king of Scotland, 6-113  
**Alexander III**, king of Scotland, 6-\*112, 113  
**Alexander I**, king of Yugoslavia, 6-364  
**Alexander the Great, king of Macedon, life and reign**, main article, 12-†346-49; 5-†178-80  
   artists in court of, 11-53  
   Bucephalus tamed by, 12-347  
   Campaspe and, 13-9  
   death, 12-349  
   funeral carriage, 10-144  
   Diogenes and, 13-10  
   efforts to become a god, 5-180  
   empire, 5-†178-80; 12-†347-49  
   map, 5-\*180  
   in art, 11-†54, 55, \*56  
   marriages, 12-349  
   meeting with Porus, 5-\*179  
   oriental culture brought to Greece by, 12-178  
   peacocks brought to Greece by, 4-191  
   portrait busts, 11-\*54; 12-\*349  
   pupil of Aristotle, 5-178; 13-9  
   receives family of Darius, painting, 12-\*348  
   steel brought from India by, 12-3  
   wars and conquests, 5-†178-80; 12-347-49  
   Egypt, 5-72  
**Alexander the Great**, wars *continued*  
   India, 5-370  
   Palestine, 5-127  
   Persia, 5-†105, 178  
**Alexander Jagellon**, king of Poland, 6-448  
**Alexander, Sir Harold**, 6-\*548  
**Alexander, Miss**, portrait by Whistler, 11-\*357  
**Alexander Archipelago**, Alaska, 8-16-A  
   map, 8-561  
**Alexander Land**, Antarctica, discovered, 13-506  
**Alexander Mosaic, Pompeii**, 11-54, \*56  
**Alexander sarcophagus**, carved relief, 11-\*54, 55  
**Alexander's Hunt**, carved relief, 11-\*54, 55  
**Alexandria**, czarina of Russia, 6-439  
   portrait, 6-\*438  
**Alexandria**, Egypt  
   a seaport, 10-235  
   burned by Arabs, 5-182  
   Cleopatra's court, 5-70  
   founded by Alexander the Great, 12-349  
   glass production, 12-27, 29  
   Hellenistic culture, 5-180, 181  
   library, 10-556  
   mean temperature, 5-73-B  
   Pharos (Lighthouse), 5-181, \*186, 187, 10-226  
**Alexis I**, czar of Russia, 6-429  
**Alexius I, Comnenus**, Byzantine emperor, attempts to restore empire, 5-408, 409  
**Alfalfa**, plant, 9-334, 335  
   soil benefited by, 10-546  
**Alfonso**, *see* Alphonso  
**"Alfred," John Paul Jones' flagship**, 12-501  
**Alfred the Great**, king of West Saxons, reign, 6-12  
   and the burned cakes, 6-\*11  
   Asser, friend and biographer, 6-137  
   costume, 9-\*20  
   Danes defeated by, 6-†12; 10-10  
   statue, 6-\*11  
   timepiece, 10-\*462  
   writes stories of Ohthere's voyages, 13-494  
**Algae**, plants, main article, 2-†66-69  
   Arctic regions, 2-195  
   colors, 2-66, 67  
   coral reefs built with aid of, 1-56  
   diatoms, 2-\*68, 69  
   killed by copper sulphate, 10-542  
   lichens made of alga and fungus, 2-79  
   nullipores, 1-56  
   reproduction, 2-67  
**Algebra**, mathematics, 10-432-35  
   beginning of; how it works, 10-424  
   Omar Khayyam's book on, 13-89  
**Algenib**, star, star maps:  
   Jan. and Feb., 1-178-A  
   July and August, 1-178-G  
   May and June, 1-178-E  
   Nov. and Dec., 1-178-K  
   Sept. and Oct., 1-178-I  
**Algeria**, French colony, Africa, 5-455; general data, 5-473-C-473-D  
   climate, 5-473-C  
   government, 5-473-D

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Algeria**—*continued*

- location, 5-473-C
- map, 5-574
- native life, 5-\*450, 9-\*21
- people, 5-473-C
- physical features, 5-473-C
- phosphates, 1-97
- provinces, 5-473-D
- rivers, 5-473-C

**Algiers**, capital of Algeria, Africa, 5-454, 455  
 coaling station, 10-237  
 location by Lat and Long., 5-473-C  
 rainfall and temperature, 5-473-C

**Algol**, the demon star, 1-174  
 star maps

- Jan and Feb., 1-178-A
- March and April, 1-178-C
- Nov. and Dec., 1-178-K
- Sept. and Oct., 1-178-I

**Algonkian**, or **Algonquian**, Indians, 8-440

- Abnaki branch, 8-150
- Chippewas members of, 8-191
- Colorado, 8-48
- Delaware, 8-64
- Delaawares and Mohicans, 8-250, 270
- Illini group, 8-96
- Indiana, 8-111
- Maryland, 8-159
- Michigan, 8-181
- Montana, 8-216
- Narragansett Indians members of, 8-344
- Nebraska, 8-224
- New Hampshire, 8-238
- Ohio, 8-305
- Western branches, 8-451

**Algonkian period**, forms of life in, table, 3-64

**Algonquin**, Lake, of Ice Age, 1-92

**Algonquin Indians**,

- ceremonies, 7-\*115
- French allies, 7-11

**Alhambra**, palace, Granada, Spain, 6-\*323

- Court of the Lions, 11-\*451
- Fountain of the Lions, 1-\*47
- gate, 6-\*323
- Mohammedan monument, 11-449
- tilework, 12-56

**"Alhambra, The,"** by Washington Irving, 13-294

**Ali**, caliph, of Arabia, 5-398

**"Ali Baba and the Forty Thieves,"** fairy tale, text, 14-†362-65

**"Alice in Wonderland,"** by Lewis Carroll, 13-266, 267

- portrait of the original Alice, 13-\*266

**"Alice-Sit-by-the-Fire,"** play by Sir James Barrie, 13-268

**Alien and Sedition Acts**, 7-109, 203

**Alimentary canal** (digestive tract), 2-\*352, 354

**"Alis Volat Propriis,"** motto of Oregon, 8-332

**Alkali flats**, New Mexico, 8-256

**Alkalis**

- burns, treatment, 2-405
- in digestive juices, 2-358

**Alkalis**—*continued*

- potash, 1-97

**"Alki,"** motto of Washington, 8-428-A

**Alkyd plastics**, 10-553

**All-American Canal**, 8-42

**All England Croquet Club**, tennis rules and matches, 14-467

**All Fools' Day**, *see* April Fools' Day

**"All for Love,"** by Dryden, 13-174

**"All for Our Country,"** motto of Nevada, 8-234-B

**"All God's Chillun Got Wings,"** drama by O'Neill, 13-354

**All Hallows' Eve**, 14-586

**All Souls' Day**, observance of, 14-584

**Alla**, king in "Canterbury Tales," 14-†332-35

**Allah**, Mohammedan name for God, 5-416, 419; 11-449

**Allahabad**, India, pilgrims in Ganges, 5-\*370

**"Allahabad Pioneer,"** Kipling's contributions to, 13-269

**Allan**, Sir Hugh, 7-25

**Allan**, John, Poe adopted by, 13-314, 315

**Allan-a-Dale**, in story of Robin Hood, 14-356

**Allegheny Mountains**, U. S., 7-343-C

- Pennsylvania, 8-341

- Virginia, 8-418

- West Virginia, 8-436-A

**Allegheny Plateau**, region of United States

- Kentucky, 8-138-A

- Pennsylvania, 8-340, 341

- West Virginia, 8-430, 436-A

**Allegheny River**, U. S., 10-255

- New York, 8-283

- Pennsylvania, 8-341

**"Allegory,"** meaning of, 13-171

**Allegri**, Antonio, *see* Correggio

**"Allegro, L',"** by Milton, 13-167

**Allemanni**, Germanic people, *see* Alemanni

**Allen**, Eliza marries Sam Houston, 12-†515

**Allen**, Ethan, 12-†495; 8-401

**Allen**, Ira, and Green Mountain Boys, 8-401

**Allen**, James Lane, 4-132

**"Alliance,"** U. S. ship, 7-483

**Allies**, World War, 6-275, 310; 7-318

**Alligators**, main article, 3-†443-45, 9-\*72; 7-55  
 compared with crocodile, 3-\*442, 443

- zoo, 4-479

**Alligator garfish**, 3-240, \*241

**Alligator lizard**, 3-455

**Alligator pear**, 9-194, \*195

**Alligator snapping turtle**, 3-476, †477

**Alligator State**, nickname for Florida, 8-76-A

**Alligator tanks**, 7-493

**Alligator tiger lizard**, 3-\*457

**Alligators**, nickname for Florida natives, 8-76-A

**Alloys**, metallurgy, 9-420

- amalgams, 9-416

- brass, 9-419

- bronze, 9-419

- coinage, 9-396

- German silver, 9-420

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Alloys—continued**

manufacture, 10-345  
stainless steel, 9-420  
steel, 9-401

**Allspice, 9-209****All-Union Central Executive Committee of the All-Union Congress of Soviets, Russia, 6-443****Alluvial soil, 1-97****Alma-Tadema, Laurence, painting, "A Reading from Homer," 13-\*27****Almagest, Ptolemy's star list, 1-177****Almagro, Diego de, Pizarro's partner, 5-498****Almanac, of Benjamin Franklin, 12-464****"Almayer's Folly," by Joseph Conrad, 13-273****Almeida, Antonio José de, president of Portugal, 6-342****Almond, not a nut, 9-204****Almond oil in perfumes, 9-312****Alp, meaning, 6-251****Alpaca, animal, 4-\*399****Alpha Canis Majoris, star, see Sirius****Alpha Centauri, star, 1-171, 172, 179****Alpha rays, 9-426****Alphabet, 10-†43-45, \*42**

Aramaic, 5-91

birth of present alphabet, 5-111

Braille, for blind, 10-\*62

Chinese, 5-327

deaf-mute, 10-\*6

Egyptians the first to use, 10-40; 5-111

Etruscan, 5-192

Greek, 10-42, †44, 45; 1-177; 5-112

invention, 10-38

Persian, 5-104

Phoenician, 5-111

Semitic, 10-43, 45; 5-111

**Alphard, star, star maps:**

Jan. and Feb., 1-78-B

May and June, 1-178-F

**Alpheus and Arethusa in Greek mythology, 14-\*435, 436****Alpheus River, Greece, 6-368-B****Alphonso VI, king of Leon, 6-338****Alphonso I, king of Portugal, 6-338****Alphonso III, king of Portugal, 6-340****Alphonso XII, king of Spain, 6-333****Alphonso XIII, king of Spain, 6-334**

portrait, 6-\*334

racing cup named for, 10-173

**Alphonso, duke of Ferrara, relations with Ariosto, 13-66****Alpine lamps, 2-418****Alpine people, description, 5-267**

Austrians descended from, 6-265

France, 6-202-B

peoples belonging to; where found, 5-†39

**Alps, mountain system, Europe, 1-29**

glaciers, 1-61; 13-\*433

Hannibal crosses, 12-353

depicted in painting, 5-\*213

stones broken, 1-41

**Alps—continued**

highest, 1-\*28

maps

Albania, 6-595

Austria, 6-586

Italy, 6-588

Southern France, 5-581

Switzerland, 6-584

Matterhorn, 6-\*244

St. Bernard dogs, 4-501

skiing, 14-†521

Swiss, 6-254-B

tunnel through, 10-203

Tyrolese, 6-\*274

**Alsace-Lorraine, Europe**

annexed to France, 6-181, 219

becomes part of Germany, 6-200, 229, 231

map, 6-579

restored to France, 6-202, 238

**Alsatian, dog, 4-\*490****Alsek River, Alaska, 8-16****Altai Mountains, Asia, map, 5-590****Altair, star, star map, September and October,**

1-178-J

**Altamaha River, Georgia, 8-84****Altamira, cave, Spain, art, 5-30; 11-2****Altar of Peace, Roman sculpture, 11-64, \*68****Altarpiece in cloisonné, 12-66****Altdorf, Switzerland**

iron shield, 12-\*8

monument to William Tell, 12-375

**Alternate hosts, 2-141****Alternating current, 1-507, 516****Alternation of generations**

ferns, 2-†89

hydrozoa, 3-109

mosses, 2-†83-85

**Althing, parliament of Iceland, 6-†418 fol.****Altimeter, 1-456; 10-328-Q-328-R****Altitudes, high**

air pressure, 1-402, 404, 456

physical reaction to changes, 1-456

atmospheric pressure; sea level and mountain top, 1-258

balloon records for weather man, 1-259

boiling point varies, 1-402, 404

effect on respiration, 1-456; 2-342

Professor Piccard's ascent, 1-456

table showing altitudes of globe, 1-25

**Alto, musical instrument, see Viola****"Alton Locke," novel by Charles Kingsley, 13-247****Altricial birds, 4-6****Alum**

used in tanning, 9-68

**Aluminum, element, source and uses, 9-420**

added to gold, 9-396

airplane industry's use of, 10-548

chemical behavior, 1-547

factory, 9-\*421

melting point, 1-\*392

producing regions, 9-421; 7-33-A, 343-F

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Aluminum—continued**

- product of electro-chemistry, 10-548
- racing shells made of, 14-532
- symbol, atomic no. and wt., 1-\*551
- **Aluminum paint**, for airplanes, 9-422
- Aluminum pans**, mineral used for manufacture, 8-29
- Alva, Fernando Alvarez de Toledo**, duke of, cruelty; statue attacked, 6-†347
- Alvarez**, lieutenant of Cortes, murders Aztecs, 7-76
- Alvarez, Juan**, president of Mexico, 7-84
- Alveoli**, air cells of lungs, 2-†334 fol.
- Alvord Desert**, Oregon, 8-331
- "Always thus to tyrants," Virginia's state motto, 8-418-A
- A. M.**, abbreviation, 10-472
- Amadas, Philip**, 13-479
- Amadeo**, king of Spain, 6-333
- Amalgams**, metals, 9-417
- Amanita muscaria*, toadstool, 2-\*73, 76
- Amanullah Khan**, ameer of Afghanistan, 5-435
- Amargosa River**, Nevada and southeastern California, 8-42
- Amati family**, violin makers, 12-224, 225, 258
- Amatol**, explosive, 10-418
- Amazon parrots**, 4-190, \*192
- Amazon River**, So. Amer., Peruvian Andes to Atlantic Ocean, 10-241; 5-494, 518-A
  - basin, 5-518-F
  - area, 10-257
  - difference between high and low water, 2-264
  - floating islands, 2-264
  - length, 10-253
  - map, 5-603
- Amazon section of Brazil**, 5-518-F
- Amazons**, mythological women, 14-†425
  - Hercules' battle with, 14-429
  - sculptures, 11-\*39
    - Amazon on horseback, 9-\*6
- Ambassadors, U. S.**, duties, 7-374
- Amber**, buried resin, 2-95
  - fossil insects found in, 3-6, \*18, 53
  - origin and uses, 9-313
  - power of attraction, 1-494
- Ambergris** of whale, 4-446
  - used in perfumes, 9-302
- Amboina (Ambo)**, Dutch E. Indies, 5-529-B
- Ambrose, Saint**
  - establishes rules for church music, 12-212
  - Saint Augustine influenced by, 13-532
- Ambry**, cupboard, 12-181
- Ambulacrum** of starfish, 3-\*130
- Ambulance**, toy, how to make, 14-†38
- Ambulance team**, first aid during London "blitz," 2-\*399
- "Amelia," by Fielding, 13-188
- Amendments to U. S. Constitution**, *see* United States Constitution
- Amenemhet I**, pyramid builder and king of Egypt, quoted, 11-409
- Amenemhet III**, king of Egypt, 5-60

- Amenhotep I**, king of Egypt, 5-62
- Amenhotep IV (Ikhnaton)**, king of Egypt, reign; influence upon art, 11-16
  - religion, 5-64
- Ament**, *see* Catkin
- America**
  - architecture, *see* American architecture
  - art, *see* American art; American crafts
  - classification of peoples, 5-44
  - colonization
    - first European colony, Haiti, 7-57
    - Greenland by Northmen, 6-483
    - Spanish districts, 5-500
    - the thirteen English colonies, 7-†121-33,
  - discovery and exploration, 7-†110-19
    - Columbus' discoveries, 7-†113-17; 13-†447-55
    - divided between Spain and Portugal, 6-341
    - French exploration and colonization, 7-†2-7, †135-43
    - Northmen, 7-1, †110-12
    - Spain, 7-114-19
    - Vespucci's voyages, 13-457
    - see also biographies of explorers, listed in Contents Volume 13*
  - Indians, 7-†89-108, color plate, frontispiece; *see also* Indians, American
  - literature, *see* American literature
  - Monroe Doctrine: end of Spanish rule, 5-506
  - origin of name, 13-457
  - territory held by European countries before and after 1763, 7-†139, 143
  - twentieth century changes, 13-345
  - see also* American colonial life; Central America; North America; South America; and under names of countries, as Canada; Mexico; United States
- "America," ocean liner, 10-\*293
- "America," yacht, wins challenge cup, 14-528
- "America for the Americans," 7-337
- "American, The," by Henry James, 13-336
- American architecture**, main article, 11-†495-524
  - colonial, 11-501-8
  - nineteenth and twentieth centuries, 11-510-24
  - of early settlers, 11-†495-99
  - Spanish style, 7-\*384
- American art**, main article, 11-†352-77
  - Mexican, 11-392
  - painting, 11-†353-72
  - sculpture, 11-\*358-61, 364, \*352, \*373-77, \*391
  - use of bronze, 12-24
- American Automobile Association**, driving courses, 2-447
- American Beauty**, rose, breeding of, 2-227
- American brown pelican**, Louisiana's state bird, 8-146-A
- American cheese**, how made, 9-†346-47
- American church, Rome**, mosaics, 12-\*113
- American cities**, *see* subhead cities under various states
- American colonial life and history**, main articles, early, 7-†121-33; eighteenth century, †145-55
- architecture, 11-†501-8

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**American colonial life and history—continued**

- army uniforms, 7-**\*473**
- costume, 9-**\*14-15**
- Delaware, 8-64-65
- dwellings
  - colonial mansion, 7-**\*151**
  - New England, 7-**\*146, 148, \*149**
  - heating, 7-145
- farming methods, 7-452
- flags, 14-**+574**
- food, 9-229
- furniture, 12-**+196-98**
- Georgia, 8-78-79
- glass manufacture, 12-**+36-37**
- learn art of silversmithing from England, 12-90
- Maryland, 8-158-60
- Massachusetts, 8-166-72
- militia, 7-472
- naval force, 7-481
- New Hampshire, 8-237-38
- New Jersey, 8-250-51
- New York, 8-270-77
- North Carolina, 8-286-92
- Pennsylvania, 8-334-36
- plantations, 8-408
- points of difference between North and South, 12-518
- postal service, 10-87
- relations with England, 7-126, **+157-63, 363; 6-81**
- Rhode Island, 8-343-45
- South Carolina, 8-350-51
- thirteen original colonies, list, 7-173
- trade; New England, 8-170
- transportation, 10-146
- Virginia's plans and place in political life, 8-408-10, 412
- see also* Revolutionary War
- American Cordilleras**, 7-33-A; 1-20, 28
- American crafts**
  - carving, *see* Carving, American Indian
  - furniture, 12-174, 195-99
  - glass and glassware, 12-36-38
  - goldsmithing and silversmithing, 12-**+90, \*91**
  - porcelain, 12-61
  - see also* Indian arts and crafts
- "American Credo, An,"** by H. L. Mencken, 13-350
- American Dust Bowl**, 8-362-63; 7-466
  - Arkansas, 8-30
  - growth of grass and weeds encouraged, 7-470
  - Kansas, 8-130
  - Nebraska, 8-226
  - Oregon, 8-324
- American (bald) eagle**, 4-**+151, \*152**
- American embassy**, Berlin, 7-**\*371**
- "American Essays,"** by Washington Irving, 13-294
- American Expeditionary Force**, 7-322; 12-**\*554, 555**
- American Fall**, Niagara River, 1-**+78**

- American Farmer Labor party**, 8-197
- American Federation**, of the first thirteen states, 7-361
- American Federation of Labor**, 7-561, 563, 283, 309
- American Fur Company**, 7-231; 8-441
  - Astoria founded, 8-326
  - scouts sent up Missouri, 8-299
  - South Dakota, 8-360
- American furniture**, 12-**+174, +195-99**
- American historical biographies**, 12-**+458-555-J**
  - Adams, John, 12-479
  - Allen, Ethan, 12-495
  - André, Major John, 12-484
  - Arnold, Benedict, 12-485
  - Boone, Daniel, 12-469
  - Brown, John, 12-533
  - Calhoun, John C., 12-520
  - Clay, Henry, 12-517
  - Crook, George, 12-489
  - Dewey, Admiral George, 12-540
  - Eisenhower, Dwight David, 12-555-F
  - Franklin, Benjamin, 12-463
  - Grant, Ulysses S., 12-535
  - Hale, Nathan, 12-497
  - Hamilton, Alexander, 12-507
  - Henry, Patrick, 12-482
  - Houston, Sam, 12-514
  - Jackson, Andrew, 12-511
  - Jackson, Stonewall, 12-539
  - Jefferson, Thomas, 12-503
  - Jones, John Paul, 12-500
  - Lee, Robert E., 12-525
  - Lincoln, Abraham, 12-527
  - MacArthur, Douglas, 12-555-H
  - Marshall, George Catlett, 6-567
  - Penn, William, 12-461
  - Perry, Commodore Oliver Hazard, 12-499
  - Pershing, John J., 12-554
  - Pitcher, Molly, 12-492
  - Putnam, Israel, 12-494
  - Roosevelt, Franklin D., 12-555-A
  - Roosevelt, Theodore, 12-542
  - Smith, Captain John, 12-458
  - Stark, John, 12-488
  - Washington, George, 12-473
  - Wayne, Anthony, 12-491
  - Webster, Daniel, 12-523
  - Wilson, Woodrow, 12-548
- American history**, *see* America, history; United States history
- American Indians**, *see* Indians, American
- American Junior Red Cross**, 7-431
- American League**, baseball, 14-508
- American Library Association**, 10-561
- American literature**
  - beginnings; early writers, 7-243
  - biographies, 13-289-355
    - Alcott, Louisa May, 13-**+319-21**
    - Bryant, William Cullen, 13-297-98
    - Burroughs, John, 13-425-26

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**American literature, biographies—continued**

- Cooper, James Fenimore, 13-295-97  
 Dickinson, Emily, 13-322-23  
 Edwards, Jonathan, 13-291-92  
 Emerson, Ralph Waldo, 13-303-5  
 Field, Eugene, 13-343-44  
 Harris, Joel Chandler, 13-338-39  
 Harte, Bret, 13-333-34  
 Hawthorne, Nathaniel, 13-299-301  
 Holmes, Oliver Wendell, 13-308-9  
 Howe, Julia Ward, 13-316-17  
 Howells, William Dean, 13-331-32  
 Irving, Washington, 13-293-95  
 James, Henry, 13-336  
 Lanier, Sidney, 13-335  
 London, Jack, 13-340-41  
 Longfellow, Henry W., 13-301-3  
 Lowell, James Russell, 13-311-13  
 Melville, Herman, 13-324-25  
 O. Henry, 13-341-43  
 Poe, Edgar Allan, 13-314-15  
 Riley, James Whitcomb, 13-337-38  
 Stowe, Harriet Beecher, 13-317-19  
 Thoreau, Henry David, 13-310-11  
 Twain, Mark, 13-327-30  
 Whitman, Walt, 13-326-27  
 Whittier, John Greenleaf, 13-306-7  
*see also references to authors in index*  
 comes into its own, 13-345 fol.  
 contemporary American authors, 13-345-55  
 Realism, 13-346  
   Howells, William Dean, 13-332  
   Lewis, Sinclair, 13-345, 350  
   Wharton, Edith, 13-346, \*351  
**American Museum of Natural History**  
   pamphlets on Indians, 14-550  
   contributions of Theodore Roosevelt, 12-546  
**American music**, 12-257, †321  
**American National Red Cross**, 7-428 fol.  
**American nightingale** (mocking bird), 4-134  
**American pasque flower**, 8-364 A  
**American Relief Administration in Russia**, 6-441  
**American Revolution**, *see* Revolutionary War  
**American River**, Calif., 8-42  
**American robin**, Connecticut's state bird, 8-62  
**"American Soldier,"** sculpture by Jacob Epstein, 11-391  
**American swift**, lizard, 3-457  
**American System**, advocated by War Hawks, 7-222  
**American Telephone and Telegraph Company**  
   formation and work of, 10-\*108  
**"American Tragedy, An,"** 13-347  
**American Woman Suffrage Association**, 12-572  
**"America's" cup**, yachting trophy, 14-528, 530  
**Americium**, element, 1-\*551  
**Amerigo Vespucci**, *see* Vespucci, Amerigo  
**Amerinds**, name for American Indians, 7-89  
**Ameripol**, 9-271-B  
**Ames**, Iowa, college at, 8-123  
**Ames**, Ohio, Coonskin Library, 10-557

- Amethyst**, quartz, 9-433  
   color plate, 9-frontispiece  
**Amherst pheasant**, bird, 4-187, \*189  
**Amiens, Treaty of**, 12-428  
**Amiens Cathedral**, 11-460  
   plan, 11-\*457  
   statue of The Beautiful God, 11-†98  
**Amino acids** in human body, 2-362, 367  
**"Aminta,"** by Tasso, 13-68  
**Amir**, *see* Ameer  
**Ammeter**, instrument, 1-\*509  
**Ammonia**  
   a waste product of body, 2-367  
   chemical process for forming, 10-546  
   in air, 1-377  
   use in refrigeration, 1-409, 410; 10-519  
   uses, 10-546  
**Ammonia dynamite**, 10-418  
**Ammonites**, fossils, 3-24  
**Ammonium chloride**, in electric cell, 1-498, 499  
**Ammonium nitrate**, 10-418  
**Ammonium sulphate**, by-product of coal, 9-446, 447  
**Ammonoosuc River**, U. S., 8-242-A  
**Ammunition**  
   bombs, 1-\*558-A-558-H, 10-368-A  
   bullets and shells, 10-360, 361, \*365  
   cannon, 10-358, 361  
   Chile saltpeter, 10-546  
   gunpowder, 10-360, 416, 417  
   potashes, 10-546  
   tank, 10-\*368-A  
**Amnesty, Proclamation of**, 7-268  
**Amoeba**, animalcule, 2-\*21, \*280  
**Amon** (Amon-Ra), Egyptian god, 5-64, 12-\*80  
**"Among the Millet,"** by Lampman, 13-577  
**"Amoretti Sonnets,"** by Spenser, 13-150  
**Amorites**, Semitic people, 5-118, 82, 85  
**Amos**, people, 5-126  
**Amoskeag mills**, in New Hampshire, 8-240  
**Ampère, André**, 1-508  
**Ampere**, electricity, 1-508, 515  
**Amphibians**, classification, 3-†68  
   newts and salamanders, 3-†428-31  
   prehistoric, 3-29, 39, 64  
   toads and frogs, 3-†415-26  
**Amphibious Corps and Boats**, 7-493  
**Amphictyonies**, councils of ancient Greece, 5-154  
**Amphipods**, crustaceans, 3-188  
**Amphitheaters**, Roman, 11-432  
**Amphitrite**, wedded to Neptune, 14-435  
**Amphora**, Greek jar, 12-\*49, 50; 11-\*35  
**Amphtrac**, amphibious tractor, 10-\*367  
**Amplifier**  
   for radio, 10-121-P, 121-Q  
   for sound pictures, 10-\*506  
   in Radio City Music Hall, 12-330  
**Amsterdam**, Holland, 6-354; 10-256  
   link with Rhine waterway, 10-256  
   location by Lat. and Long., 6-355-A  
   overside port, 10-246

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Amsterdam—continued**

rainfall and temperature, 6-355-A  
trade, 10-246

**Amsterdam, Fort, Manhattan Island, 7-138**

**Amu Darya** (ancient Oxus), river of Central Asia, length, 10-253

**Amulius**, king, relations with Romulus and Remus, 5-197

**Amundsen, Roald**

Arctic flights, 13-501, 502; 10-320

map of routes, 13-502-A

Northwest Passage found by, 13-499

portrait, 13-508

South Pole discovered, 13-†508 fol.

map of route, 13-502-B

**Amur River, Siberia, U. S. S. R.**

basin area, 10-257

basin seized by Russia, 6-436

length, 10-253

map, 5-581

outlet, 6-443-A

**Amusements, see Contents Volume 14**

on steamship, 10-300, 302, \*303

*see also* Magic; Puzzles; Riddles; Sports and Games; Stories; Things to do; Things to make; Tricks

**"Ana,"** termination, meaning, 8-146-A

**Anabaena**, an alga, 2-68

**"Anabasis,"** by Xenophon, 5-177

**Anabolism** in cells, 2-361

**Anaconda**, snake, 3-\*483, 496, \*498; 4-\*477

**Anaconda**, Montana, smelting, 8-219

**Anaconda Company**, copper mines, 8-\*217

**Anadir**, Gulf of, Bering Sea, map, 6-603

**Anaemia**, disease, cause and cure, 2-345, 348

**Anaesthetics**, 10-550; 2-395

nitrous oxide, 13-385

**Anagrams**, game, 14-162

**Anaho Island Bird Refuge**, 8-234-B

**Analytical geometry**, 10-425

**Anam**, *see* Annam

**"Ananias Club,"** 12-547

**"Anathema,"** by Leonid Andreyev, 13-97

**Anatolia**, section of Turkey, 5-414-B

map, 5-582

**Anatomy (see Contents, Volume 2 and also main subjects below)**

blood, 2-†344-50, color plates, frontispiece, \*327

bones, *see* Anatomy, skeleton

brain, 2-†383-90, color plates, \*278, \*326

ears, 2-†282-85, †302-5

eyes, 2-†295-300, color plate, \*278

Galen's book on, 13-359

heart and circulatory system, 2-†369-81, color plates, frontispiece, \*279, \*327

lungs, 2-†333-42, color plates, \*278, \*279, \*327

muscles, 2-†326-31, color plate, \*326

nerves, 2-†392-97

organs of digestion, 2-†352-58, color plates, \*278, \*326

sense organs of taste and smell, 2-†307-9

**Anatomy—continued**

skeleton, human, 2-†318-24, color plates, \*278, \*327

skin, 2-†287-93

teeth, 2-†331-16, color plate, \*278

*see also* Physiology, and also parts of anatomy, as Foot; Hand

**Anatomy, of animals**

comparisons

beaks of birds, 4-\*11, 13, 194

evolution of horse, 4-\*507

evolution of elephant's trunk, 3-\*54

toes of birds, 4-13

*see also special parts of animals, as* Beaks; Foot; Wings

**Anatomy in art**

Donatello's sculpture, 11-129

executed by Greeks, 11-37, 38, 46

medieval sculpture, 11-88

**"Anatomy Lesson,"** Rembrandt, 11-\*272, 273

**Anaxagoras**, Greek philosopher

astronomical ideas, 1-113, 169

teacher of Euripides and Pericles, 13-37

**Anaximines**, Greek philosopher, 13-2

**Ancestor worship**

China, 5-318

Red Paint People, 8-150

**Anchises**, and Venus, 14-\*450

**Ancient Dominion**, nickname for Virginia, 8-418-A

**"Ancient Mariner, The Rime of the,"** by Coleridge, 13-215, 218

**"Ancient Port of Ostia, The,"** painting by Claude Lorrain, 11-\*230

**"Ancients, The,"** Blake's followers, 13-213

**Ancona**, Italy, resists Frederick Barbarossa, 6-\*296

**Andaman Islands**, Bay of Bengal, maps, 5-587, 589

**Andersen, Hans Christian**, life, main article, 13-†83-86

childhood home, 13-\*84

fairy tales, 13-86

portrait, 13-\*85

tale about Blue Grotto, 1-87

"The Little Sea-Maid," 3-72

**Anderson, Maxwell**, dramatist, 13-355

**Anderson, O. A.**, ascent into stratosphere, 1-\*372; 10-314

**Anderson, Robert**, at Fort Sumter, 7-255

**Anderson, Sherwood**, author, 13-351

**Anderssen, A.**, chess game, 14-488, 489

**Andes**, mountain system, South America, 1-28; 5-494, 518-A

Andean condor, bird, 4-\*159

climate, 5-518-B

Colombia, 5-518-E

Inca ruins, 5-\*503

map, 5-602

Mount Aconcagua, 1-\*26

temples in, 1-25

Venezuela, 5-518-E

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Andorra**, state, Europe, 6-†468
- Andrassy, Gyula (Julius), Count**  
at Congress of Berlin, 6-\*232  
foreign minister, 6-273
- André, John, character; death**, main article, 12-†484-85  
and Benedict Arnold, 12-485, 487
- Andrée, Salomon A.**, attempt to reach North Pole, 13-501
- Andreoli, Giorgio**, 15-58
- Andrew II**, king of Hungary, Golden Bull granted by, 6-279
- Andrew III**, king of Hungary, 6-280
- Andrews, Roy Chapman**, 4-\*446
- Andreyev, Leonid**, life and works, main article, 13-96-97
- "Androcles and the Lion,"** drama by George Bernard Shaw, 13-272
- Andromache**, parting with Hector, 5-\*151
- "Andromaque,"** by Racine, 13-113
- Andromeda**, constellation, 1-†182, 183  
star maps showing  
Jan. and Feb., 1-178-A  
July and August, 1-178-G  
March and April, 1-178-C  
Nov. and Dec., 1-178-K, 178-L  
Sept. and Oct., 1-178-I, 178-J
- Andromeda and Perseus**, mythological characters, 14-425, \*427  
painting by Nicias, 11-\*70
- Andros, Edmund, Sir**, colonial governor, 8-171, 251  
and Connecticut charter, 8-57
- Androscoggin River**, New Hampshire and Maine, 8-156
- Anemia**, *see* Anaemia
- Anemometer**, air current measuring instrument, 1-\*274
- Anemones**, sea, *see* Sea anemones
- Aneroid barometer**, 1-261, \*455, 456
- Anesthetics**, *see* Anaesthetics
- Angara River**, Siberia  
map, 5-581
- "Angel Dictating the Gospels to St. Matthew, The,"** painting by Poussin, 11-\*234, 237
- Angel Falls**, South America, highest in world, 5-518-F
- Angel fish**, 3-\*195, 201, 205, \*206
- Angelico, Fra (Giovanni da Fiesole)**, art style, 11-134  
Christ lowered from cross, painting, 11-\*133  
surrounded by angels, painting of, 5-\*279
- Angers, France**, Ducal palace, 11-103
- Angiosperms**, seeds of, 2-125
- Angkor**, ruined ancient city, Cambodia  
archaeology, 5-19  
temple of, 5-429
- Angle**, geometry, 10-437
- Angleland (England)**, 6-111  
name of Britain changed to, 6-206
- Angler fishes**, 3-\*209
- Angles**, Germanic people, 5-264, 269, 271  
England, 5-292; 6-137, 206  
Scotland, 6-111  
*see also* Anglo-Saxons
- Anglesey (Mona)**, island, Wales, Druids, 6-137
- Anglican Church**, *see* Church of England
- Anglo-Egyptian Sudan**, Africa, *see* Sudan, Anglo-Egyptian
- Anglo-Irish art**, Lindisfarne gospels, 11-†84
- Anglo-Irish War**, 6-161, 162
- Anglo-Saxon Chronicle**, 6-20  
page from, 5-\*311; 10-\*10
- Anglo-Saxon Conquest**, 6-8
- Anglo-Saxon language** (Old English), 10-10  
Beowulf written in, 14-†318-19
- Anglo-Saxons**, people, 6-9  
days of week named by, 10-483  
distribution after Conquest; map, 6-\*5  
language, *see* Anglo-Saxon language  
religion, 6-9  
weapons, 6-\*9  
*see also* Angles; Saxons
- Angola** (Portuguese West Africa), description and history, 5-468  
custom of filing teeth, 2-\*315  
map, 5-577  
native life, 5-\*466
- Angora**, capital of Turkish republic, *see* Ankara
- Angora cat**, 4-487
- Anguilla** (Snake Island), West Indies, 7-63
- Angular design** in basketry, 12-†128
- Aniline dyes**, 9-307  
disadvantages, 12-142
- Animal products**, 10-546  
food, 9-†317-20; *see also* articles listed in Volume 9 and also names of foods, as Caviar; Liver
- Animal worship**, *see* Animals, sacred
- Animals** (*see* Contents Volumes 3 and 4 and also main subjects listed below)  
amphibians, 3-†415-31, †68; *see also* Amphibians  
anatomy, *see* special parts, as Claws; Mouth  
Aristotle's study of, 13-9  
beasts of burden, 10-†128 fol.  
burro, 10-\*132  
camel, 4-398  
dogs, 4-498, 500; 6-\*346, 348; 10-129, 130, \*133  
donkey, 4-\*506; 6-\*313; 10-\*130  
elephant, 10-\*133  
horse, 4-\*506, 510; 10-\*128, \*133  
llama, 4-400  
man, 10-129, 130, \*131, \*132  
ox, 10-\*133  
reindeer, 10-\*133  
water buffalo, 4-394  
yak, 4-396
- birds**, 4-†1-239; *see also* Birds and Contents, Volume 4  
breeding aided by Mendel's laws, 13-413

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Animals—continued**

caged, in former times, 4-475  
 carnivores, 4-285, 331  
   prehistoric, 3-52, 54  
 cell structure of amoeba, 2-21  
**classification**, 3-†66-70  
   Agassiz, 13-432  
   Cuvier, 13-†423-24  
   invertebrates, 3-68, †69  
   vertebrates, 3-†68, 12, 15, 29, 196; 4-57  
 cold-blooded, 3-434, †68  
 coloration, protective, *see* Protective devices  
 communication, 3-66; 10-1, \*2, \*3  
 conservation of wild life, *see* Conservation  
 domestic, *see* names of animals, as Cats; Horses  
 domestication, 4-307; 5-34; 6-\*464, 9-317, 318; 10-129  
 drawing and mounting, 14-†59-69  
 dyes obtained from, 9-305  
 evolution, *see* Evolution  
 experiments on  
   brain study, 2-384, 387, 388  
   nutrition study, 2-\*390  
 extinct, 4-†344, 390, 442; 5-475, 532; *see also*  
   Animals, prehistoric  
 farm, *see* Live stock; Poultry  
 feet, similarities and differences in, 13-\*435;  
   *see also* Foot  
 first aid to injured, 2-†412  
**fishes**  
   **fresh-water fishes**, 3-224, †226-42; 9-368  
     shellfish, 3-†254-62  
   **marine fishes**, 3-\*73, \*109, \*113, \*149, †194-215  
   **migratory**, from fresh water to sea, 3-†244-52  
   *see also* Fishes  
 follow plant life on earth, 3-6  
**foods from**, 9-†317-20  
   bibliography, *see* Volume 15  
 \* *see also* articles listed in Contents Volume 9  
   and also names of foods, as Caviar; Liver  
**fresh-water**, 3-†222-24  
 fur bearing, 4-254, †295, 357, 362, 373, 379, 400, 468  
   ermine, 4-\*355, 356  
   rabbit fur in hat manufacture, 9-†89  
   seal, 4-331  
   slaughter of, 4-140  
 germ carriers, 2-18, 388; 4-383  
 growth, 2-10  
 habitations  
   beaver dams and lodges, 3-223; 4-373-76  
   prairie dog towns, 4-†370-71  
 seal rookeries, 4-†328-29  
 underground tunnels, 4-†277, 369  
*see also* Nest-building  
 herds, *see* Herds, of animals  
 heredity in, studies, 13-†414  
 hibernation, 2-16; 3-467; 4-372  
 hoofed, *see* Hoofed animals  
 in soil, 1-97

**Animals—continued**

in zoos, 4-†474-81  
**insect eating**, 4-†271-82, †450 57  
**insects**, 3-†269-413 (*see also* Contents Volume 3 and Insects)  
 invertebrates, *see* Invertebrates  
 language, *see* Animals, communication  
 mammals, 4-†241-514 (*see also* Contents Volume 4 and Mammals)  
 man distinguished from other animals, 2-319  
 marine life, *see* Ocean, animals in  
 microscopic, 3-69  
 miniature, how to make, 14-†7, †13, †14  
 most active of backboned, 4-57  
**myriapods** (centipedes, millepedes, etc.), 3-†264-67  
 names derived from Greek word for, 1-177  
 nocturnal life, a way to observe, 14-511  
 one-celled, *see* Unicellular organisms  
**prehistoric**, 3-†1-64, *see also* Prehistoric animals  
 preying  
   **birds**, 4-†151-68  
     mammals, 4-285, 300, 312  
 products from, *see* Animal products  
 reproduction, *see* Reproduction, biology  
 reptiles, 3-†433-502, *see also* entries under Reptiles  
 ruminants, 4-403  
 sacred baboon, 4-259  
   Egypt, 3-329, †332, 442, 4-148, 486; 5-\*67  
   India, 3-485, 4-†255, 394; 5-\*368, 384  
   Japan, 4-\*409  
   Rome, 5-203, 212  
 scent production, 4-296, 358, 360, 382, 435, 9-302  
   birds, 4-217  
   insects, 3-283, 337, 355, 381, 398  
   millepedes, 3-267  
   sea creatures, 3-84, 114, 117  
**sea creatures**, *see* Ocean, animals in  
 search for salt, 9-413, \*414  
 seeds dispersed by, 2-212  
 sense of smell, 2-308  
 sense of sound, 2-302  
 senses and sensation of four-footed animals, 3-70  
 shadow pictures, 14-\*8  
 shelter and homes built by, *see* Animals, habitations  
 size  
   largest land dwellers, 3-70; 4-337, 345  
   largest of modern age, 4-445, 447  
   smallest hoofed animals, 4-416  
   smallest land dwellers, 3-70  
 skins of, used for leather, 9-†66, \*69, †72  
**spiders**, 3-†406-13; *see also* Spiders  
 stories about, 13-42; 14-323  
 subspecies, 4-135  
 swimming ability, 14-534  
 trained, 4-332  
 unicellular, *see* Unicellular organisms  
 vaccination against disease, 13-368

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Animals** -continued

- wild, how to look for, 3-70
- wild-life conservation, *see* Conservation
- Animals in art**
  - ancient pottery, 12-†48; 52
  - Assyro-Babylonian art, †1-†22-27
  - Barve's sculptures, 11-†332, 335
  - Cretan art and pottery, 11-†32, \*33; 5-†146; 12-†13, †48
  - Egyptian art, 11-†12, \*15
  - Greek art, 11-32
  - how to draw, 14-†59-62, 64
  - Landseer's paintings, 4-†502, \*513; 11-†319
  - modern paintings, 11-†333
  - portrayal forbidden by Koran, 12-56
  - prehistoric caves, 11-1-4, 4-†510; 5-†6, 7, 27 fol.
  - symbols of evangelists, 11-27, 77
- "Animals That Talk like Men,"** 14-†255-308
- Animated cartoons**, in motion pictures, 10 †512 A-512-B
- "Animis Opibusque Parati,"** quotation from "Aeneid," 8-356 A
- Ankara**, capital of Turkish republic, 5-414
  - dam, 5-†414-A
  - president's home, 5-†414 A
- Ann Arbor**, Mich., university located at, 8-180
- Anna Carolina**, queen of Naples, costume, 9-†9
- Anna Ivanovna**, empress of Russia, 6-430
- "Anna Karenina,"** novel by Count Leo Tolstoy, 13-92
- Annam**, Viet Nam republic, Indo China, 5-430-B, 420, 430
- Annam**, capital of Transjordan, 5-401
- Annamese**, inhabitants of Indo China, 5-430
- Annapolis, Md.**, statehouse, 8-†158
  - meeting of convention for framing constitution, 7-179
- United States Naval Academy**, 7-†488-B
- Annapolis**, Nova Scotia, founded, 13-481; 7-4
- Anna's humming bird**, 4-141
- Anatto tree**, dye obtained from seeds, 9-305
- Anne**, queen of England, 6-74
  - flag, color plate, 14-facing \*572
  - typewriting machine patent issued by, 10-64
- Anne of Austria**, queen of France, 6-181
- Anne of Cleves**, queen of Henry VIII, 6-46; 12-393
  - painted by Holbein, 11-214
- Anne of Denmark**, queen of Scotland, marriage to James III, 6-118
- "Anne of Green Gables,"** book, 7-29-1
- Anno Domini**, origin of term, 10-476
- Annual (growth) ring of tree**, 2-†28, †29
- "Annunciation"**
  - Donatello's carving, 11-129, \*130
  - Rossetti's painting, 11-†317
  - Simone Martini's painting, 11-†117
- Annunzio, Gabriel d'**, 6-310; 13-†71
- "Annus Mirabilis,"** by Dryden, 13-174
- Anolis lizard**, 3-455
- Anopheles mosquito**, 3-†362
- Anselm, Saint**, 6-20
- Ansgar**, Apostle of the North, 6-377
- Ant**, *see* Ants
- Ant bear**, *see* Aard vark
- Ant cows**, aphids, 3-324, †325
- Ant hills**, 3-320, \*322, \*324
- Ant lion**, insect, 3-†383, \*381
- Antaeus**, giant, son of Earth, 14-430; 11-138
- Antarctic Circle**, 1-204
  - crossed by Captain Cook, 13-506
- Antarctic Ocean**
  - map, 13-502-B
  - relative size, 1-†66
  - sea creatures found in, 3-113
- Antarctic regions**
  - birds
    - gulls, 4-†204
    - larks, 4-223, 224
    - penguins, 13-†504, \*505; 4-†218
  - discovery and explorations, 13-†503-12
    - Captain Cook's voyage, 13-489
  - highest and lowest altitudes, 1-25
  - life in, 4-217
  - map, 13-502-B
  - prehistoric period, 3-35
  - seals, 4-332, 335
  - see also* South Pole
- Antarctica**, continent
  - discovery, 13-503, 508
  - map, 13-502-B
- Antares**, star, star maps showing:
  - July and August, 1-178-II
  - May and June, 1-178-F
- Anteaters, animals**, 4-†450-57, †471, 472; 3-†326
- Antelopes, animals**, 4-†415-25
  - appearance in Pliocene era, 3-57
  - fear of ants, 3-†327
  - herd with bartebeests and zebras, 4-417
  - horns, 4-†37
  - roam with oriches and zebras, 4-233, 352
  - royal antelope, 4-413
- Antennae**, radio, *see* Aërial
- Antennae**, zoology
  - crab, 3-176, †180
  - crayfish, 3-187
  - insects, 3-273, 287, \*294, 320
  - lobster, 3-186
- Anther**, of flower, 2-†102-3, \*172
- Antheridium** (sperm case), of plants, 2-†83, \*84, \*89
- Anthony, Saint** (of Thebes), 5-†278
- Anthony, Saint**, protector of children, 11-90
- Anthony, Mrs. Joseph**, portrait by Stuart, 11-†355
- Anthony, Susan Brownell**, life and work, main article, 12-†571-72
  - portrait, 12-†572
- Anthony's towhee**, bird, 4-†136
- Anthracene oil**, fraction of coal tar, 9-447
- Anthracite coal**, 9-438
- Anthracnose**, plant disease, 2-†139
- Anthrax**, vaccination against, 13-368

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Anthropology**, the science of man, 5-48  
   study of prehistoric man, 5-†23-40  
   *see also* Man, prehistoric; Races of man
- Anti-aircraft gun**, 10-\*368-B, 368-E, 475; 7-\*475
- Antibiotic**, defined, 9-\*216
- Anti-Comintern Pact**, 6-315
- Anti-Engagers**, in Scottish history, 6-127
- Anti-Federalists**, American political party, 12-505  
   meeting to oppose Constitution, 8-333  
   *see also* Democratic party (Republicans)
- Anti-Semitism**, 5-138
- Anti-Trust Act, Sherman**, 7-289, 309, 315
- Antibodies** formed by blood, 2-350
- Anticosti, Island of**, Canada, given to Joliet, 13-487
- Anticyclones**, 1-228
- Antidotes for poisoning**, 2-404, 408
- Antietam, Battle of**, 7-262
- Antietam Battlefield**, national monument, 8-162-A
- "Antigone,"** by Sophocles, 13-\*35, 36
- Antigone**, in Greek mythology, 14-454
- "Antigone Pouring a Libation,"** statue by William H. Rinehart, 11-\*373
- Antigonus the One-Eyed**, general of Alexander the Great, 5-180
- Antigua**, island, West Indies, description, 7-63  
   map, 7-601  
   physical features, 7-54-B
- Antilles, Greater**, islands, West Indies, description and history, 7-†53-59; general data, 7-60  
   climate, 7-33-M  
   maps, 7-600, 591
- Antilles, Lesser**, islands, West Indies, 7-†62-66  
   climate, 7-33-M  
   maps, 7-601, 591
- Antimony**, element, symbol, atomic no. and wt., 1-\*551  
   pewter made from, 9-420
- Antioch**, in Pisidia, Asia Minor  
   archaeology, 5-\*1-3, †4-6  
   founded by Seleucus, 5-4, 180
- Antioch, Turkey**, Roman arch, 11-62
- Antioch Chalice**, 12-\*84
- Antiochus III (the Great)**, king of Syria, 5-218
- Antiochus IV**, king of Syria, 5-129
- Antiope**, queen of the Amazons, 14-425, 448
- Antipater of Sidon**, names Seven Wonders of the World, 5-184
- Antiphony**, book of church music, notes from, 12-\*212
- Antiphony**, music, 12-204
- Antiques**, 12-198  
   Roman trade in, 11-61
- Antiquities**, *see* Archaeology; Arts and crafts
- "Antiquities of Athens, The,"** by Stuart and Revett, 5-18; 11-288
- "Antiquity, History of Art of,"** by Winckelmann, 11-288
- "Antiquity of Man, The,"** by Sir Charles Lyell, 13-431
- Antiseptics**, discoveries, 10-550  
   Lister's discovery, 13-372
- Antithrombin** in blood plasma, 2-348
- Antitoxins** formed by blood, 2-350
- Antlers**  
   deer, 4-405 fol., †411, 415, \*421  
   wild cattle, 4-\*395
- Antofagasta**, Chile, trade 10-241
- Antoine, André**, Theatre Libre founded, 12-333
- Antonello da Messina**, 11-†172  
   portrait of a condottiere or soldier-leader, 11-\*172
- Antonius, Marcus** (Mark Antony), Roman general  
   and Cleopatra, 5-225; 12-361, 363  
   Cicero put to death by, 13-47  
   fondness for gem collecting, 12-105  
   triumvirates, 5-225; 12-362
- Antoninus, Marcus Aurelius**, *see* Marcus Aurelius Antoninus
- "Antony and Cleopatra,"** play by Shakespeare, 5-226; 13-158
- Ants**, insects, main article, 3-†320-27  
   anatomy, 3-320  
   animals that prey upon, 4-†450-57, 472  
   aphids milked by, 3-324, †325  
   drones, 3-322, 323  
   eggs and hatching, 3-321, †322  
   habits and customs, 3-323, 324, 326  
   hills, 3-†320, 321, \*322, \*324  
   leaf-cutting, 2-392  
   queens, 3-321, 322, 323  
   sense organs, 2-392  
   social life, 3-321, 324, 326, 327  
   soil formation helped by, 1-97  
   "white ants" not ants, 3-374; *see also* Termites workers, 3-321, 322
- Antwerp**, Belgium, 6-345, 346; 10-256  
   becomes trading center of world, 6-326  
   cathedral, 6-346; 11-\*92  
   center of art and weaving, 11-201  
   map, 6-593  
   people destroy statue, 6-\*347  
   submission to Margaret of Parma, 6-\*350
- Anvil**, ear bone, 2-303
- Anvil Chorus** from "Il Trovatore," 12-253
- Anzacs**, soldiers from Australia and New Zealand, in World War I, 5-560-B
- Aorta**, artery, 2-\*362, \*371  
   branches, 2-373, 377, \*380  
   color plate, 2-\*279
- A.P.** (Associated Press), 10-79
- Ap** in Welsh names, meaning of, 6-139
- Apache Indians**, 8-21, 22; 7-\*107  
   headdress, 9-\*93  
   Oklahoma land grant, 8-317  
   surrender to General Crook, 12-†490
- Apache State**, nickname for Arizona, 8-24-A
- Apalache Indians**, 8-6
- Apalachicola River**, U. S., Georgia through Florida into Gulf of Mexico, 8-76

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Apalachicola River**—*continued*

Alabama, 8-8  
Georgia, 8-84

**Apathy**, in Stoic philosophy, 13-12

**Ape-man**, *see* Java man

**Apelles**, Greek painter, 11-53

**Apennines**, mountains, Italy, 1-29; 6-315-B  
map, 6-588

**Apes**, main article, 4-†241-49

Barbary ape, 4-258  
compared with monkeys, 4-251  
first appear in Miocene period, 3-53  
*see also names of various apes, as* Chimpanzee;  
Orang-utan

**Apetalae**, plant division, main article, 2-†157-60

**Apex**, tip of tongue, 2-†308

**Aphids** (plant lice)

domesticated by ants, 3-324, †325  
insect destroyers, 3-282, 335, 365; 5-473

**Aphis** lion, grub, 3-382

**Aphrodite**, goddess, *see* Venus

**Aphrodite**, sea worm, 3-†25, †126

**Aphrodite of Cnidus**, statue, 11-†51, 52

**Aphrodite of Melos**, statue, 11-†51

**Apiary**, place for keeping bees, 3-†317

**Apis**, sacred bull, 5-67

**Apo, Mount**, in Philippine Islands, 5-570

**Apollinaris Spring**, Yellowstone Park, 1-36

**Apollo**, (Phoebus Apollo), god, myths, 14-411,  
†439 fol.; 1-†100

Admetus aided by, 14-454

Clymene and Phaëthon, 14-†413-15

Clytie and, 14-441

Colossus of Rhodes, statue of, 5-†186, 187

contest with Pan, 2-†302, 5-158; 14-460

Daphne and, 14-†439, 440-41

Delphic oracle, 5-†148, 154; 14-444

gives ass's ears to Midas, 5-158; 14-†459, 460

healings recorded in temples of, 13-358

Hyacinth and, 14-442

lyre, 5-158; 12-†205

Marsyas slain by, 14-460

muses and, 12-†205

Niobe's sons slain by, 11-†49, 50; 14-458

Orpheus son of, 14-432

Pompeian statue, 11-†65

temple at Bassae, 5-†17, 18

temple at Delphi, 5-148

**Apollo**, Greek name for morning star, 1-146

**Apollo Belvedere**, statue, 11-†60, †65

**"Apollo Served by the Nymphs,"** sculpture by  
Girardon, 11-†232

**Apoon**, a mouth of Yukon River, 8-16

**Apostle of the North** (Ansgar), 6-377

**Apostle spoons**, 12-90

**"Apostles, Acts of the,"** tapestry, 12-142

**Apostles of Christ**

Dürer's painting of, 11-†210, 211

symbols for, 11-77

**"Apotheosis of Homer, The,"** painting by Ingres,  
13-†29

**Appalachian mountain system**, 7-343-C, 33-M;  
1-27

age and formation, 1-21, 22

eastern chain, 8-149

geosyncline, 1-20

maps, 7-591, 595

North Carolina, 8-296

vegetation, 7-343-E

Virginia, 8-418

West Virginia, 8-431

**Appalachian Plateau**, U. S., 7-343-C

**Appalachian Trail**, 8-155

**Appalachian Valley, Great**, *see* Great Appalachian  
**"Appeal to the Great Spirit,"** statue by Cyrus  
E. Dallin, 11-†376

**Appeals, court of**, in New York State, 8-284

**Appeasement policy**, 6-108

**Appellate divisions of supreme court**, in New  
York, 8-284

**Appellate jurisdiction**, meaning, 7-366

**Appendix** in man and herbivores, 2-358

**Appert**, discovers way to can food, 9-226

**Appetite secretion** in mouth, 2-356

**Appia, Adolph**, work in theater, 12-334

**Appian Way**, Roman road, 10-†150, 151

**Appius Claudius**, *see* Claudius, Appius

**Apple**, *see* Apples

**Apple blossom**, 2-116

Arkansas' state flower, 8-30-B

Michigan's state flower, 8-186-B

**Apple-blossom festival**, Wenatchee, 9-163

**Apple contest**, game, 14-159

**Apple race**, game, 14-157

**Apple tree borer**, insect, 3-†343

**Appleby, John**, invents twine binder, 10-413

**Apples, blossoms; fruit**, main article, 2-†115-16,  
†162

best in the world, 9-164

growing of, 9-†161-64

Nova Scotia, 7-29-M, †29-L

potted tree, 2-†264

rate of transpiration of apple tree, 2-51

Shenandoah Apple Blossom Festival, 8-418-A

Sir Isaac Newton's tree, 1-14

skin, 2-116

starch storage in apple tree, 2-53

Virginia, 8-†414, 415

water content, 2-259

water content of leaves, 2-259

**Apples, golden**

in Hippomenes' race with Atalanta, 14-453

obtained by Hercules, 14-429

**Apples, ducking for**, game, 14-160

**Appleton, Wis.**, manufacturing, 8-444

**Applied force**, lever, 1-†324

**Applied science**, *see* Invention and applied  
science

**Appiqué work**, how to make, 14-†73

**Appomattox, Va.**, historical significance, 7-414

**Appomattox Courthouse**, Va., Lee's surrender,  
7-265; 12-526

**Appomattox River**, Petersburg located on, 8-417

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Apprentices** in medieval guilds, 5-310  
**Apra**, harbor of Guam, 8-465  
**Apricots**, 9-168  
**April**, origin of name, 10-482  
**April Fools' Day**, 14-582  
**"Apron,"** change in spelling of term, 10-22  
**Apse**, architecture, 11-\*442, 443, \*463  
**Aqua Claudia**, Rome, 10-\*535  
**Aquamarine**, gem, color plate, 9-frontispiece  
**Aquarium**, how to make and keep, main article, 14-†2-5  
**Aquariums**, public, main article, 3-†217-20  
**Aquarius** (Water Carrier), constellation, 1-178  
   star maps showing  
     July and August, 1-178-11  
     Nov. and Dec., 1-178-1.  
     Sept. and Oct., 1-178-J  
   zodiac, 1-\*170  
**Aquatic**, plants, etc., *see* Water, plants, etc.  
**Aqueducts**, 10-212, †538-41  
   Los Angeles, 10-\*536, 540  
   New York City water supply, 10-538 fol.: 7-398  
   Ashokan Reservoir, 10-\*539, \*540  
   Croton Dam, 10-\*539  
   Roman, 10-\*535, 537, 538; 11-\*427, 429  
   Aqua Claudia, 10-\*535  
   Pont du Gard, Nîmes, France, 10-\*210  
   Segovia, Spain, 11-62, \*63  
**Aqueous humor of eye**, 2-\*296, 297  
**"Aquiline nose,"** meaning, 5-115  
**Aquinas, Thomas, Saint**, writings, 6-299  
**Aquitaine**, duchy, France, Richard the Lion-hearted's rule, 12-372  
**Arab horse**, 4-\*511, \*512, 514  
**Arab League**, 5-401; 6-556  
**Arabesque**, style of ornamentation, 11-242, 449; 12-56  
**Arabia**, Saudi, country, Asia, description and history, main article, 5-†394-401; map, 5-580  
   airittials  
     camel, 4-†398  
     horse, 4-\*511, 514  
     hyrax, 4-345  
     lizard, †3-449  
   bazaars, 5-417  
   change of capitals, 5-398  
   civilization affected by climate, 1-195  
   climate, 5-336-C  
   desert life, 5-\*394, †395  
   flag, color plate, 14-following 570, no. 58  
   Lawrence in, 5-401  
   language, *see* Arabic language  
   life and customs, 5-†395, \*397, †398, †401, †418-21, 423  
   Mohammedanism, 5-†396-98, †416-23; 11-449; 13-522  
   musical instrument from, 12-\*223  
   part of Turkish empire, 5-400  
   people in other countries, 5-399; *see also* Arabs  
   physical features, 5-394

**Arabia---continued**  
   products and industries  
     coffee, 9-129, 130; 5-398  
     date culture, 9-190  
     oil, 9-453, \*455  
     sheep raising, 5-\*401  
   racial classification of desert peoples, 5-43  
   sacred city of Mecca, 5-398  
   struggles over caliphate, 5-398  
   trade, 5-401  
     in ancient times, 5-395  
   transportation, 5-\*395, 420  
   united as Saudi Arabia, 5-401  
   Wahhabis, 5-399  
   *see also* Arabs  
**Arabian camel**, 4-†398  
**Arabian Desert**, Egypt  
   climate, 5-336-C  
   map, 5-578  
   Semitic tribes, 5-99  
**"Arabian Nights' Entertainment,"** 14-†361-76  
   hero of, 5-398  
**Arabian Sea**, map, 5-580  
**Arabic language**  
   Koran written in, 5-417  
   spread by Mohammedanism, 5-397, 417  
**Arabic numerals**, 10-†422  
**Arabs**, description and history, main article, 5-†394-401  
   Africa, 5-445, †450, 451, †453-54  
   caravans, 5-\*394  
   character, 5-401  
   conquest of Persia, 5-105, 397, 399  
   contributions to civilization, 5-395, 399  
   defeat by Charles Martel, 5-403  
   Egypt, 5-†71 fol.  
   Europe in the Middle Ages, 5-269  
   invasion of India, 5-373  
   Iraq, 5-\*79-81, \*90, 92  
   jeweler, 5-\*396; 12-\*92  
   lute introduced into Europe, 12-258-10  
   medieval civilization outside Arabia, 5-399  
   Mohammedanism, 5-†416-23, †396-98, 280  
   Morocco, 5-473-C  
   paper making, 9-274, 275  
   physical characteristics, 5-336-D  
   pilgrimage to Mecca, 5-†416-23  
   Portugal, 6-337  
   sheik's headdress, 9-\*93  
   Spain, 6-320; *see also* Moors  
   tent, 11-\*400  
   trade between India and Europe, 5-378  
   use of iron, 9-408  
   *see also* Arabia; Moors; Saracens; Semites  
**Arachne**, turned into spider by Minerva, 14-†458-60  
**Arachnoid**, anatomy, 2-\*387, \*394  
**Arafura Sea**, East Indies, map, 5-597  
**Aragon**, ancient Spanish kingdom, 6-322, 340  
**Aral, Sea of**, Soviet Russia, Asia, 6-443-A  
   map, 6-601  
**Aramaic language**, 5-89, 91

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Arameans**, people, description and history, 5-80, 91

map of ancient kingdom of, 5-48

Palestine, 5-118

revolt against Israel, 5-124

writing, 5-91

**Aramis**, character in "The Three Musketeers," 13-128

**Arapahoe Indians**, in Wyoming, 8-451

**Ararat, Great**, mountain, Asia, 5-106

"**Araucana, La**," epic poem by Ercilla, 5-499

**Araucanian Indians**, 5-499, 515

**Arbela**, Assyria, Alexander the Great's entry, 5-178; 12-\*346, 349

**Arbitration**, among countries

South American boundary disputes, 5-510

United States and Great Britain, 8-14

see also Hague; Webster-Ashburton Treaty

**Arbitration, industrial**, 7-562, 563

**Arbor Day**, 14-583

**Arbor vitae**, wood, 9-258

**Arbuckle Mountains**, Oklahoma, 8-320-A

**Arbuthnot, John**, 13-184

**Arc, Jeanne d'**, see Joan of Arc

**Arc, electric**, 1-\*513

temperature, 1-\*392

**Arc light**, 10-392

**Arcade**, architecture, 11-432

**Arcade du Cinquantenaire**, Brussels, 6-\*346

**Aradia**, Greece, 14-\*437

on map, 5-\*150

**Arcadia of pastoral poets**, 9-79

**Arch**, 11-†427-28, †452, 462, \*463

aqueducts, 10-\*210, \*546, 11-\*63

arcade, 11-432

bridge, 10-\*210, \*211, 212, 214

Colosseum, 11-\*433

developed into dome, 11-407

Etruscan, 5-194

invention of Sumerians, 5-82

natural, in rocks, 1-\*70, \*71

Roman, 11-\*61, 62, 64, 427, †428

Romanesque, 11-88, 452

triple, gate to Antioch, 5-\*2

triumphal, 6-\*346; 11-†291

types of, 11-462, \*463

**Arch of Constantine**, 11-\*435

**Arch of foot**, 2-319

**Arch of Septimus Severus**, Rome, 5-\*231

**Arch of Titus**, Rome, 11-\*61, 64, \*437

carved relief, 11-\*68

**Arch of Triumph**, Paris, 11-†291; 6-\*202-A

**Archaeologists**, problems and duties, 5-2

**Archaeology**, main article, 5-†1-21

Aegean civilization, 11-415-17; 5-16, 17

Evans, Sir Arthur, excavations, 5-17, 143; 11-31

Antioch excavated, 5-†1 fol.

Assyrian, 5-14; see also Art, Assyro-Babylonian

aviation an aid to, 5-21

Babylonian, 5-†13, 14, 16; see also Art, Assyro-

Babylonian

**Archaeology**—continued

Behistun rock, 5-104

British Museum, excavations, 5-\*75

Bronze Age, 12-13 fol.

Caroline Islands; ruins, 5-521

**cave dwellers**, 11-†1-4; 5-\*6, 7, 27 fol.

cliff dwellings, 7-†93-95

Crossus, 5-17, 143

Crete, 5-16, 17, 143; 12-82

Denmark, see Archaeology, Scandinavia

Easter Island, 5-\*520, 521

Egyptian, 5-†6 fol.

bread making, 9-238, \*239, 240

Carter, Howard, work of, 5-8, 10

history revealed, 5-48

mummies, 5-\*51, 54, \*56, \*64

records of ships, 10-161

Tutankhamon's tomb and treasures, 5-†7 fol.; 12-120

see also Egypt, *subheads* art: arts and crafts

early excavations, 11-286

early piracy and modern methods, 5-8, 10, 18

Greek antiquities, 5-†16, 19-20; 2-†321-22;

see also Greece, *subheads* art: crafts

Hallstatt period, 6-257; 12-8

Hittite cuneiform deciphered, 5-115

Indian (American), 7-†90 fol.

Central America, 5-19; 7-\*42, 44

Mexico, 5-19, 7-†69-72

South America, 5-495, \*503

Indo-China, 5-19

temple of Angkor in Cambodia, 5-429

La Tène period, 12-8

Mesopotamian ruins, 5-†11 fol.

bake ovens, 9-\*240

dwellings, 11-396

temples, 11-†405-8

Moabite stone, 5-125; 10-\*42

mounds, see Mounds

Mycenaean discoveries, 5-17, \*20

Pacific islands, 5-\*520, 521, 529

prehistoric remains, 11-†1-4; 5-\*6, 7, 27, 30, \*31, 32; 6-317

reconstruction from fragments, 12-\*56

Roman remains, 5-\*18, 19, 232

Pompeian ruins, 5-†258-60, 9-241

see also Forum Romanum

Rosetta Stone, 5-8; 10-\*41, 42

Scandinavia, 6-371, †373, 376

Sumerian, 5-†11, †12, 14, \*75, \*81

Swiss lake dwellers, 5-\*33-35, 36-40; 6-244,

\*245; 9-†46, 97, 119, 166, 238; 11-\*397

Troy excavated, 5-\*15, 16, 143

University of Pennsylvania, excavations, 5-\*75; 8-334

Ur, 5-\*11, †12, 14; 11-404, \*405; see also Ur, antiquities

restoration of skeletons, 5-\*24, \*25

**Archaeopteryx**, prehistoric bird, 3-43

**Archangel**, Russia, 10-261

**Archean complex**, geology, 1-†40

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

**Archean period**, 3-6, 9  
 forms of life in, table, 3-64  
**Archegonium**, (egg case), of plants, 2-\*83, \*84, \*87  
**Archelaus**, king of Macedon, Euripides at court of, 13-37  
**Archeozoic era** (Dawn of Life), 3-6; 1-40  
 forms of life in, table, 3-64  
**Archer**, Scott, 10-448  
**Archer**, constellation, *see* Sagittarius  
**Archers**, Persian, 11-\*27, 28  
**Archers**, at Battle of Crécy, 6-27  
**Archery**  
 Hundred Years' War, 6-27  
 Middle Ages, 5-\*305  
*see also* Bow and arrow  
**Arches**, rock formations, Utah, 7-419  
**Arches of feet**, 2-319  
**Archil**, dye, 2-80  
**Archimedes**  
 claims that he could move earth, 1-†334  
 fires ships with sun's rays, 1-115, \*116  
 tests weight of gold crown, 1-\*467, 470  
**Archimedes, Law of**, 1-\*467, 470  
**Archimedes screw**, water-lifting device, 10-529  
**Archipenko**, Alexander, sculptor, 11-392  
**Architecture**, main article, 11-†394-524 (*see also* Contents Volume 11 for chapter headings)  
 balconies, Danish, 6-\*416-A  
 city planning, 7-†446-48  
 cliff dwellings, 7-†93-95  
 decoration and ornament, 12-\*94  
 Gothic, 11-†474  
 Greek, 11-†425  
 Renaissance, 11-491  
 from hut to pyramid, 11-403-13  
 furniture that resembles, 12-\*183, 186, \*192  
 orders, 11-\*416, †418-25, 430, 432  
 primitive shelters, 11-†395-400  
 skyscrapers, 11-†510, †515-24  
 building of, 9-380  
 styles  
 Aegean, 11-415-17  
 American  
 colonial, 11-†501-8  
 early settlers, 11-†495-99  
 nineteenth and twentieth centuries, 11-†510-24  
 Spanish style, 7-\*384  
 Assyro-Babylonian, 11-†403-8  
 Byzantine, 11-†445-49; 12-\*94  
 Chinese, 11-†394, †400-1  
 Christian (early), 11-†440-43  
 church, *see* Cathedrals; Church architecture;  
 Church decoration and ornament;  
 Mosques  
 classical, *see below subheads* Greek and Roman  
 America, 11-512, 514  
 model for Renaissance, 11-482  
 Cretan, 11-415-16  
 domestic, *see* Houses; Shelter

**Architecture**, styles-- *continued*  
 Egyptian, 11-†409-13; *see also* Egypt, architecture  
 English  
 Elizabethan, 11-\*480, †491  
 Gothic, 11-†472-78  
 Norman, 11-456  
 Renaissance, 11-\*492, 493  
 Etruscan, 5-194; 11-427, 430, 432  
 French  
 Francis I style, 11-486, 488  
 Gothic, 11-†459 fol., 474  
 New Orleans, 8-\*143  
 Renaissance, 11-486, †488-90, 491  
 Romanesque, 11-455  
 Gothic, 11-†459-78; *see also* Gothic architecture  
 Greek, 11-†415-25; *see also* Greece, subhead architecture  
 Indian (American), 7-†92 fol.  
 Mayan, 7-90  
 Indian (East)  
 mosques and temples, 11-†453  
 Taj Mahal, 11-†450; 9-†432; 5-\*366  
 Italian  
 Byzantine, 11-446  
 copied by French, 11-490  
 effect of light on, 11-462  
 Gothic, 11-\*465, \*467, 476  
 Renaissance, 11-†482-86, \*487  
 Romanesque, 11-450 fol.  
 Japanese  
 gateway, 11-\*394  
 pagoda, 11-400  
 medieval, *see* Architecture, Gothic; Architecture, Romanesque  
 Mesopotamian, *see above* Assyro-Babylonian  
 modern (nineteenth and twentieth centuries), 11-†511-24  
 Moorish, 11-449, \*451; 6-\*321  
 Arabia, 5-419  
 Norman, 11-456  
 Renaissance, 11-†480-93  
 Roman, 11-†61-64, †427-38; *see also* Roman architecture  
 Romanesque, 11-†450 fol.  
 America, 11-512, 514  
 Saracenic (Mohammedan), 11-†449-51, \*453  
 Kabul, entrance to mosque, 5-\*433  
 Spanish style, California, 7-\*384  
 United States, *see* Architecture, American  
*see also* Archaeology; Bridges; Building construction  
**Architrave**, architecture, 11-\*418, 420  
**Archives**, 10-556  
**Archives Building**, Washington, D. C., 11-523  
 painting from, 12-\*496  
**Archon**, prime minister of ancient Athens, 5-159  
**Archytas** of Tarentum, mathematician, 13-4  
**Arcite**, in "Canterbury Tales," 14-†335-36  
**Arcola**, Italy, Napoleon's victory at, 12-\*425

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Arctic circle**, 1-204

crossed by Captain Cook, 13-490

map, 13-502-A

Point Barrow, Alaska, 8-16

rainfall, 8-16-A

Sweden lies in, 6-407-A

*see also* Arctic regions**Arctic Current**, along Eastern Canada, 7-33-A**Arctic fox**, 4-†305-6**Arctic hare**, 4-388**Arctic Ocean**

maps, 13-502-A; 5-573

relative size, 1-\*66

rivers emptying into, 7-33 A; 8-16

Russian irrigation project, 10-261

sea creatures found in, 3-113

**Arctic regions**

animal life, 4-†305, \*312 fol., \*320-22, 360, †411

birds, 4-120, \*122, 128, 129, \*153, 168, 200,  
202, 213, \*224, 229; 11-352, \*376Eskimo dogs, 4-492, †496, 498, \*501; 13-\*493,  
\*499, \*508, \*511; 10-130, \*133

mosquitoes, 13-497

seals, 4-†327-35; 13-\*494

cold, 1-†208, †209; 7-29-W

exploration, 13-190, †493-502

flights over, 13-502; 10-320

map, 13-502-A

midnight sun, 10-\*476

people, 7-29-X, \*33-L; *see also* Eskimos

plant life, 2-195; 7-\*29-T

adaptation to environment, 2-205

springtime, 4-306

*see also* North pole**Arctic whale**, 4-447**Arctic zone**, 1-204**Arctos**, constellation (The Bear), 13-503**Arcturus**, starlight from, opens Chicago World's Fair of  
1933, 1-†413

star maps showing

March and April, 1-178-C

May and June, 1-178-F

**Ardebil, Persia**, rug from mosque, 12-154**Area**

algebra used to compute, 10-433

units of measurement, 10-375

**Arena**, Roman, 11-434**Arena chapel**, Padua, paintings by Giotto, 11-\*113**"Areopagitica,"** by Milton, 13-168**Arequipa**, Peru, beauty; intellectual life, 5-507**Ares**, *see* Mars, god**Arethusa**, in Greek mythology, 14-\*435, 436, 456**Aretino**, blackmailer, friend of Titian, 11-179**Arezzo**, Italy, cathedral, 12-\*75**Arfe, Juan de**, sculpture by, 11-\*246**Argali**, sheep, 4-\*425, 426**Argand, Aimé**, 10-388**Argentan**, France, lacemaking, 12-172**Argentina**, country, South America, **description and history**, 5-514-15; general data, 5-518-G-518-H

arbitration of boundary dispute; erects "Christ of the Andes," 5-510

area, 5-518-G

birds, 4-115, \*118

climate, 5-518-G

flag, color plate, 14-following 570, no. 3

government, 5-518-H

history, 5-449, 505 fol.

location, 5-518-G

map, 5-604

people, 5-518-H

physical features, 5-518-H

polo, 14-525

products and industries, 5-\*505, 515

agriculture and cattle raising, 9-98, 329, 81;  
5-\*505

provinces, 5-518-H

rivers, 5-518-H

trade, 5-515

beef export, 9-329

merchant marine, no. of, 10-232

turkeys exported, 9-359

transportation; railroad, 10-200

**Argolis**, dist., Greece, on map, 5-\*150**Argon**, gaseous element

atmosphere contains, 1-219, 376, 377

inert, 1-547

symbol, atomic number, atomic weight, 1-\*551

**Argonaut**, nautilus, 3-\*145, 172**Argonauts**, mythological, 14-449**Argonne, Battle of the**, 1918, American troops in, 7-326**Argos**, city-state of ancient Greece, 5-153**Argus pheasant**, bird, 4-187, \*189**Aria** (aria da capo), music, 12-223, 236**"Aria da Capo,"** poem by Edna St. Vincent Millay, 13-352**Ariadne**, daughter of Minos, and Theseus, 5-\*143, 14-448**Arian Christianity**, 6-319**Arica**, seaport, Chile, 5-510**Arid lands**, 7-455**Aried**, star, star maps showing:

July and August, 1-178-G

May and June, 1-178-E

Nov. and Dec., 1-178-K

Sept. and Oct., 1-178-I

**"Ariel,"** racing clipper ship, 10-172**Aries** (Ram), constellation, 1-178

star maps showing

Jan. and Feb., 1-178-B

March and April, 1-178-C

Nov. and Dec., 1-178-L

Sept. and Oct., 1-178-I

zodiac, 1-\*170

**Arion**, Greek poet and musician, 14-\*449**Ariosto, Lodovico**, **life and poems**, main article 13-†65-67

portrait, 13-\*66

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Ariosto of the North** (Sir Walter Scott), 13-67  
**Aristaeus**, god, woos Eurydice, 14-432  
**Aristagoras**, tyrant of Miletus, 5-160  
**Aristarchus**, Greek astronomer, 1-103  
**Aristides the Just**, 5-160, \*161; 12-338  
**Aristophanes**, Greek dramatist, **life and works**,  
 main article, 13-†39-40  
 opinion of Sophocles, 13-36; of Euripides,  
 13-37  
 portrait bust, 13-\*39  
**Aristotle**, **life and philosophy**, 13-9-10  
 definition of art, 11-46  
 on falling bodies, 1-292  
 portrait bust, 13-\*0  
 pupil of Plato, 13-5, \*7, \*8  
 thought sponges were animals, 3-82  
 tutor of Alexander the Great, 5-178  
**Aristotle's lantern**, sea urchin, 3-137  
**Arithmetic**, 10-428 32  
 beginning of, 10-423  
*see also* Mathematics  
**Arius**, founder of Arianism, before Council of  
 Nicaea, 12-365  
**"Arizona,"** song, 8-24-A  
**Arizona**, state, U. S., **description and history**,  
 main article, 8-†18-23; general data, 8-24-  
 24-B  
 agriculture, 8-21  
 cantaloupes, 9-\*152  
 animal life  
 birds, 4-140-47  
 lizards, 3-457, 458, \*459  
 area, 8-24  
 capital and capitol building, 8-\*18  
 cities, towns, list, 8-24-A  
 climate, 8-20, 24  
 constitution, 8-21  
 counties, list, 8-24-A  
 education, 8-23  
 institutions of higher learning, list, 8-24  
 • **University**, 8-\*19  
 flag, 8-24-A  
 history, 8-21  
 admitted to Union, 8-21  
 becomes U. S. territory, 7-84  
 hole made by meteor, 1-166  
 holidays, 8-24-A  
 Indians, 8-21, 24-A; 7-93, \*105  
 reservations, 8-22  
 interesting facts, 8-24-A  
 irrigation and water power, 8-21, 24  
 location, 8-24  
 map, 8-475  
 on United States map, 7-594  
 monuments, 8-24  
 Chiricahua National Monument, 8-24; 7-  
 419  
 Grand Canyon, 1-†46; 8-18-19, 24; 7-419  
 Montezuma Castle, 7-\*417; 8-24-A  
 Petrified Forest, 8-24-A, 23; 7-\*418, 421;  
 9-315; 2-\*16

**Arizona**, monuments--*continued*  
 Sunset Crater, lava formations, 8-24-A;  
 7-417  
 name, 8-24-A  
 nicknames, 8-24-A  
 parks, 8-24; 7-409  
 Grand Canyon, 1-†46  
 physical features, 8-19, 24  
 political facts, 8-24  
 products and industries, 8-22  
 reservations, game and bird, 8-24-A  
 rivers, 8-20, 24  
 state bird, 8-24-A  
 state flower, 8-24-A  
 state song, 8-24-A  
 state motto, 8-24-A  
 transportation, 8-22  
 vegetation, 8-†20  
**Arizona, University of**, 8-\*19  
**"Ark,"** boat bearing early settlers, 8-158  
**Ark, Noah's**, 5-\*117  
**Ark of the Covenant**, 5-122, \*123  
**Ark shell**, marine animal, 3-160  
**"Arkansas,"** song, 8-30-B  
**Arkansas**, state, U. S., **description and history**,  
 main article, 8-†26-30; general data, 8-  
 30-A-31  
 agriculture, 8-29  
 animal life, 4-435  
 area, 8-30-A  
 capital and capitol building, 8-\*26  
 charities and correction, list, 8-30-A  
 cities, towns, list, 8-30-B  
 climate, 8-30-A, 29  
 counties, list, 8-30-B  
 education, 8-30  
 institutions of higher learning, list, 8-30-A  
 flag, 8-30-B  
 history, 8-28  
 holidays, 8-30-B  
 Indians, 8-26  
 location, 8-30-A  
 map, 8-477; 7-595  
 minerals, 9-422  
 motto, 8-30-B  
 name, 8-30-A  
 nicknames, 8-30-B  
 parks, 8-30-A  
 physical features, 8-27, 30-A  
 political facts, 8-30-A  
 products and industries, 8-29-30  
 reservations, game and bird, 8-30-A  
 rivers, 8-30, 30-A  
 state bird, 8-30-B  
 state flower, 8-30-B  
 state song, 8-30-B  
 transportation, 8-30  
**Arkansas, University of**, Fayetteville, Ark.,  
 library, 8-\*27  
**Arkansas Post**, first white settlement in Arkansas,  
 8-28

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



- Arkansas River**, U. S., 8-30-A  
     Kansas, 8-131  
     Oklahoma, 8-320-A  
**Arkansas toothpicks**, 8-30-B  
**Arkwright**, Sir Richard, perfects spinning machine, 6-84; 10-341  
**Arlandes**, Marquis d', first balloon passenger, 1-468  
**Arles**, France  
     canal, 10-255  
     church of St. Trophime, portal carvings, 11-88, \*89  
**Arlington National Cemetery**, Virginia, 7-\*270  
     soldiers' memorial, 7-\*331  
**Arliss**, Florence, as Lady Beaconsfield, 12-\*441  
**Arliss**, George, as Disraeli, 12-\*439, \*441  
**Arm**, anatomy  
     bandaging, 2-\*401, \*407  
     muscles, 2-\*328, \*330, color plate, \*326  
     nerves, 2-\*393  
     sling for injured arm, 2-\*411  
     sucker-clad, of mollusks, 3-167, †168, 170  
**Armada**, Spanish (Invincible Armada)  
     approach signaled in England, 10-28  
     destruction by English, 6-56, 329, 12-403, 405  
     sailors from, teach industries in Orkney and Shetland islands, 6-487  
**Armadillo**, animal, 4-†453-56  
     prehistoric, 3-\*49, 56 4-456  
**Armaments**, main article, 10-†348-68-F  
     *see also* Armor; War vessels, Weapons, U. S. Army; U. S. Navy  
**Armaments conferences**, 7-484, 486; *see also* Disarmament  
**Armarium**, cupboard, 12-181  
**Armature of dynamo**, 1-†502, 507  
*Armatus*, defined, 2-184  
**Armenia**, soviet republic, U.S.S.R., 6-443-B  
     map, 5-582  
**Armenians**, people  
     descended from Hittites, 5-114, 115  
     rug dealers, 12-147  
     slaughter by Turks, 5-414  
**"Armide"**, opera, by Gluck, 12-272  
**Arminius** (Hermann), German hero, 5-\*263  
     defeats Romans, 6-204  
**Armistice**, World War I, 7-327  
**Armistice Day**, 14-587  
**Armoire**, cupboard, 12-181  
**Armor**, 10-†350 fol.  
     armorer's shop, 13-\*103  
     coat of arms, 5-307  
     fashions copied in, 10-354, \*359  
     Greek and Roman, 10-351, \*352  
     horses, 10-352, 353, \*359  
     Japanese, 10-\*359  
     medieval, 10-†352-56, 358, \*359  
     Age of Chivalry, 14-\*381  
**Armored car**, 7-\*519  
**Armored forces**, 7-479-A  
**Armour**, Jean, wife of Robert Burns, 13-210  
**Armour**, Philip D., 7-282  
**Arms**, anatomy, *see* Arm  
**Arms**, *see* Weapons  
**"Arms and the Man"**, drama by Shaw, 13-272  
**Armstrong**, E. H., 10-121-R  
**Armstrong**, E. R., designs seadrome, 10-\*327  
**Army**, United States, *see* United States Army  
**Army**, Field, *see* Field Army  
**Army corps**, U. S., 7-477, 479-E  
**Army of Liberation**, So. Amer., 12-438  
**Army of Occupation on the Rhine**, 7-331  
**Army of the Potomac**, 7-260, 262, 263  
     Grant in command, 12-535  
**Army War College**, Washington, 7-478  
**Army worm**, 3-373  
**Arnarson**, Ingolf, 6-418  
**Arnheim**, Holland, biography, main article, 6-352  
**Arno River**, Tuscany, Italy, 10-253  
     length, 10-253  
     map, 6-588  
**Arnold**, Benedict, 12-\*485-87  
     expedition against Quebec, 7-11  
     treachery, 12-487  
**Arnold**, Matthew, life and works, main article, 13-†254-56  
     portrait, 13-\*255  
     quoted, 11-231  
     "Thyrsis," 2-2  
**Arnold**, Peggy Shippen (Mrs. Benedict Arnold), 12-487  
**Arnold**, Thomas, head master of Rugby, 13-254  
**Arnolfini**, John, and his wife, portraits, 11-†195  
**Aromatic region**, former name for Somaliland, 5-458  
**Aroostook**, county, Maine  
     potato growing, 8-\*153, 154; 9-\*142  
**Arouet**, François Marie de Voltaire, *see* Voltaire  
**Arpad**, Hungarian leader, 6-277, \*278  
**Arpad**, dynasty, rules in Hungary, 6-277-83  
**"Arrangement in Black and Gray"**, painting by Whistler, 11-\*353, 359  
**Arras**, France, tapestries, 12-142  
**Arras**, meaning of term, 12-142  
**Arrector muscle** of hair, 2-290  
**Arretium**, Etruria, pottery, 12-\*52, 54  
**Arrow River**, Montana, 8-220  
**Arrowheads**, 7-\*103; 10-\*350  
**Arrowrock Dam**, Idaho, 8-\*88; 10-531  
**Arrows**  
     flight, 1-287  
     how to make, 14-†59, †49  
     poison, 2-396; 3-421, 490; 7-104; 9-219; 10-350  
**"Arrowsmith"**, by Sinclair Lewis, 13-351  
**Arroyo**, in physiography, 8-257  
**Arsenic**, element, symbol, atomic no. and wt., 1-\*551  
**Arsinoë**, Egyptian queen, 3-52  
**Arsinoitherium**, prehistoric animal, 3-52

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Art**, main article, 11-†1-392 (*see also* Contents Volume 11 *for chapter headings*)

academies, *see* Academies of Art

Aristotle's definition, 11-46

compared with photography, 11-331

cubism, 11-∗388, 391

effect of eighteenth-century changes, 11-279

effect of Mohammedanism upon, 12-56

importance of artist's medium, 12-141

impressionism, 11-344-48

internationalism, 11-392

light and shadow *see* Light and shadow in art

oriental theory, 13-519

patrons

Duke of Milan, 11-154, 199

Flemish, 11-103, 193, 262

lack of, in Holland, 11-271

Medici family, 11-126, 127, 137, 143, 160

patterns, 11-79, ∗117, 120, 242

Cubist art 11-391

Greek drapery, 11-∗39, ∗41-42, ∗44

work of French modernists, 11-350, 386

portrayal of human body in, 11-37, ∗38, 46, 88, 129

post-impressionism, 11-380

realism in, *see* Realism in art

religious influence, *see* Religious influence in art

Ruskin's influence on, 13-237

schools and workshops

first of modern world, at Padua 11-138

Flemish, 11-200

Florentine, 11-114, 143, 144, 152

styles

African, 12-96, ∗98

**American**, 11-†352-77, color plate, ∗361

Mexican, 11-392

**Assyro-Babylonian**, 11-†22 29

**Baroque**, 11-†180 88; *see also* Baroque art

**British**

Irish, 6-146; 11-†84

landscape artists; **Pre-Raphaelites**, 11-†311-20

portrait painters, 11-†293-304

Van Dyck's work in England, 11-†225 fol.

Burgundian, 11-∗92, 103, 105

Byzantine, 11-†78-81; 5-405

influence on Irish art, 11-85

Canadian, 7-29-H

Carolingian, 11-†84-86, 88

Chaldean, 11-28

Chinese, 5-†325-26, 330

**Christian**

beginnings, 11-†73-81

Byzantine, *see* Art, Byzantine

in Spain, 11-242

medieval, 11-†83-90

symbolism, 11-74

classical, *see below subheads* Greek and Roman

Cretan, 11-†31-34

**Art**, styles, Cretan- *continued*

Egyptian influence, 5-144, 146; 11-32

favorite subjects, 5-†146; 11-32

**Dutch painting**, 11-†260-77; *see also* Holland, crafts

**Egyptian**, 11-†6 20; *see also* Egypt, art

English, *see above subhead* British

Eskimo carving, 7-†39; 8-∗14; 12-95

Etruscan sculpture, 5-∗191; 11-∗62; 12-†18

**Flemish**, color plate, 11-∗360

early artists employed by Duke of Burgundy, 11-103

painting, 11-124-25, †190-203, †216-28

studied by German painters, 11-206

**French**

Carolingian, 11-†85, 86, 88

Gothic art, 11-†93-101

**Louis XIV period and following**, 11-†230-39, †279 91

modern painters; **Impressionism**, 11-†337-50; color plates, 11 frontispiece, 2nd and 3rd pages fol. ∗360

modernists, 11-†379-92

Romantic, 11-†322-35

**German**

painting, 11-†205-14

sculpture, 11-103; 12-∗21, †22

**Gothic**, 11-†92-105, 107, 110

**Greek**, 11-†31-58

*see also* Greece, *subhead* art and *subhead* crafts

Iberian, 6-318

Indian, American *see* Indians, American, crafts

Indian (East Indian), 5-375

carving, 5-∗374, ∗380; 12-102, ∗103

Greek influence, 5-370

**Italian**

Baroque, 11-†180-88

division into two main groups, 11-248

Florentine and other artists, 11-†122-47

Giotto and contemporaries, 11-†107-20

influence upon Flemish artists, 11-202

Leonardo da Vinci and Michelangelo, 11-†149-62

Raphael, 11-†164-69

Venetian artists, 11-†171-88

Japanese: ideas of art and beauty, 5-340, 351

influence upon European painters, 11-341

medieval, 11-†83-105; 5-280, *see also subhead* crafts under Middle Ages

Mesopotamian, *see above* Assyro-Babylonian

modernist

cubism, 11-∗388, 391

impressionism, 11-344-48

internationalism, 11-392

post-impressionism, 11-380

primitive art copied by artists, 12-96

Mohammedan, 11-242; 12-56

Persian, 11-∗27, †28-29

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Art, styles—continued**

- prehistoric**, 11-†1-4; 5-27, †30-32; 6-317  
 cave carvings, 4-†510; 5-\*6, 7; 12-95, \*106  
*Renaissance*, *see* Renaissance art  
**Rococo**, 12-190; 11-280; *see also* Rococo style  
**Roman**, 11-†60-71; *see also* Roman art  
**Romanesque**, 11-†86-90  
**Russian**, 11-392  
**Semitic**, 11-\*22, 25  
**Spanish**, 11-†241-58, †306-9  
   Moorish influence, 11-84, 241  
   Sumerian, 11-†23-24, †25; *see also* Sumeria  
   uniformity of art and learning, 11-87  
*see also* Archaeology; Architecture; Art institutions; Crafts; Decoration and ornament; Painting; Sculpture  
**Art and learning**, medieval, 11-84, 88  
**Art collectors**, Romans the first, 11-61  
**Art institutions**  
   New York, 8-284  
   Pennsylvania, 8-341  
**"Art of Poetry, The,"** by Boileau, 13-114  
**Artagnan, d'**, character by Dumas, 13-128, \*129  
**Artaxerxes**, king of Persia, 5-103  
**Artemis**, goddess, Diana  
**Artemisia**, queen of Caria, statue, 11-†53  
**Artemisia**, queen of Halicarnassus, 5-185  
**Artemisia tridentata**, 8-234-B  
**Arteries**, anatomy, 2-†373, †374, †375, 376, 377, \*378, \*380  
   aorta, 2-†371 fol.  
   color plates, 2-frontispiece, \*279, \*327  
   coronary, 2-\*375, 377  
   division into arterioles, 2-375  
   flow of blood through, 2-376  
   in head, 2-\*378  
   joined to veins by capillaries, 2-279  
   mesenteric, 2-\*380  
   old notions about, 2-369  
   popliteal, 2-\*396  
   pulmonary, 2-†371 fol., color plate, \*279  
   structure, 2-375  
**Arterioles**, anatomy  
   division into capillaries, 2-375  
   nerve connections, 2-379  
   widening of, 2-378  
**Artesian State**, 8-364-A  
**Artesian wells**, 1-90, \*91  
**Arthur**, legendary British king  
   in German poetry, 6-211  
   legends about, 6-8, 138; 14-377  
   Robinson's poems, 13-349  
**Round Table romances retold**, 14-†377-404  
   **Coming of Arthur**, 14-†378-82  
   **Enid and Sir Geraint**, 14-†383-86  
   **Gareth and Lynette**, 14-†387-92  
   **Quest of the Holy Grail**, 14-†393-98  
   **Sir Thomas Malory's version**, 13-†145-56  
   **The Passing of Arthur**, 14-†399-404  
**Arthur**, duke of Brittany, murdered by King John of England, 6-†23

- Arthur, Chester Alan**, president of United States, 12-456-B; 7-287  
   vice-presidency, 12-456-F  
**Arthur Kill**, stream between New Jersey and Staten Island, copper refineries, 8-248  
**Arthurian romances**, *see* Arthur, legendary British king  
**Artichoke**, vegetable, 9-150  
**Articles of Confederation**, U. S., 7-175, 179  
   revision convention, 7-362  
**Artificial lakes**  
   Hoover Dam, 10-532  
   Panama Canal, 10-272  
   map, 10-\*273  
**Artificial respiration**, 2-†410  
   method of administering, 2-†408-10  
**Artificial wood**, 9-†294  
**Artillery**, 7-\*475, 477-78  
   Coast Artillery, 7-478  
   World War I, 7-\*314  
**Artois**, France, Artesian wells, 1-90  
**Arts and Crafts**, main article, 12-†1-199 (*see also* main subjects listed below)  
   **basketry**, 12-†128-35; *see also* Basketry  
   **bronze and bronzes**, 12-†12-24; *see also* Bronze in art  
   **carving**, 12-†94-107; *see also* Carving and subdivisions of carving, as Stone carving  
   **enamels and enameling**, 12-†63-68  
   **furniture**, 12-†176-99  
   **glass and glassware**, 12-†26-38  
   **goldsmithing and silversmithing**, 12-†79-92  
   **inlay**, 12-27, 82, \*99, 102, 176 fol.  
   **ironwork**, 12-†1-10  
   **jewelry**, 12-†117-26  
   **lace and lace making**, 12-†163-72  
   **mosaics**, 12-†109-15  
   **needlework**, *see* Needlework  
   **Neolithic Age**, 5-37  
   **pottery**, 12-†41-61  
   **rugs**, 12-†146-61  
   **stained glass**, 12-†70-77  
   **tapestry**, 12-†137-44  
   *see also* subhead crafts under countries and periods, as France, crafts; Gothic crafts; Manual training  
**Arum**, wild, pollination by midges, 2-†106  
**Arum family**, botany, 2-151  
**Aruwimi River**, Africa, 5-467  
**Arvida**, Canadian city, 7-33-A, \*29-A  
**Aryan**, *see* Indo-European  
**"Aryan Way,"** philosophy of Buddha, 5-370  
**"As You Like It,"** drama by Shakespeare, 13-158  
**Asa**, king of Judah, 5-124  
**Asafetida**, drug, 10-370  
**Asbestos**, building material, 9-386  
   fireproofing with, 1-385  
   poor conductor of heat, 1-396, \*397  
   producing areas  
     Canada, 7-33-A; 29-Q  
     Vermont, 8-403

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Asbury Park**, N. J., resort, 8-246
- Ascension, Church of the**, New York, decorations, 11-364
- Asceticism**, 13-519; 5-278
- Ascophyllum**, alga, 2-\*66
- Asexual generation**, 2-†83  
of fern, 2-\*89
- Ash**, tree, 2-\*276  
generic name, 2-183  
wood of, 9-258
- Ash**, use of, in human body, 2-361
- Ash Hollow**, pioneer post office at, 10-86
- "Ash Tray, The,"** by Chekhov, 13-95
- Ash Wednesday**, 7-609
- "Ash Wednesday,"** poem by T. S. Eliot, 13-353
- Ashanti**, division of Gold Coast, Africa, 5-470
- Ashdown, Battle of**, 5-311
- Ashikaga**, shoguns, 5-350, 351
- Ashkenazim**, Jews, 5-137
- Ashland**, Ky., industries, 8-138
- Ashland**, Wis., lake port, 8-444
- Ashley, A. A. Cooper**, baron, *see* Shaftesbury
- Ashley, James Mitchell**, American legislator, Montana's name suggested by, 8-220-A
- Ashley, William Henry**, American fur trader and politician, in Montana, 8-217
- Ashokan Reservoir**, Catskill Mountains, N. Y., 10-539, †540  
aerator, 10-\*540
- Ashur-bani-pal**, king of Assyria  
hunting, carved relief, 11-26  
palace and library excavated, 5-14  
palace decoration, 12-\*202
- Ashur-nazir-pal**, king of Assyria  
carved reliefs of, 11-†27; 12-\*106  
palace excavated, 5-14
- Ashville**, N. C., resort, 8-295
- Asia**, continent, general data, 5-336-B-336-D  
animals, 5-336-C
- Arabia**, Mohammedan life and customs, 5-†416-23  
area and location, 5-336-B  
climate, 5-336-C  
monsoon (wind), 1-231  
countries east and west of the Himalayas, 5-†432-41  
countries of the Malay Peninsula, 5-†425-30  
divisions, 5-336-D  
highest and lowest altitudes, 1-25  
history, *see* Contents Volume 5  
interesting facts, 5-336 D  
joined to North America in Pleistocene Age, 3-61  
languages, 5-336-D  
maps, 5-580  
on map of World, 5-573  
Mohammedanism in, 5-416  
minerals, 5-336-C  
mountains, 5-336-B; 1-29  
musical instrument from, 12-\*226  
people, 5-336-C  
resemblance to Eskimos, 8-10
- Asia** *continued*  
physical features, 5-336-B  
products, 5-336-C  
religions, 5-336-D  
rivers, 5-336-B  
search for route to, 13-495, 499, 504  
threatened conquests of Europe, 5-403, 412  
trade routes, 10-264  
transportation, 10-263-66  
vegetation, 5-336-C  
*see also Asiatic countries, as* China; Japan
- Asia Minor**, peninsula, Asia, 5-114  
conquered by Turks, 5-408, 410  
famous Greeks in, 5-160  
Greek artists in, 11-53  
in days of Byzantine empire, 5-407  
map, 5-582  
peoples, 5-114, 403, 410
- Asiatic cholera**, bacteria of, 2-13, \*14
- Askold**, viking explorer, 6-375
- Asoka**, Buddhist emperor of India, grandson of Chandragupta, 5-371
- Asp**, of Cleopatra, 3-490; 12-361
- Asparagus**, vegetable, 9-150  
California's production, 8-39  
water content, 2-259
- Aspasia**, friend of Pericles, 5-170, \*171
- Aspen**, tree, why leaves tremble, 2-263
- Asphalt**  
bones preserved in, 3-49  
by-product of petroleum, 9-456  
Pitch Lake, 7-46-B
- Asphalt lake**, Trinidad, 7-66
- Asphyxiation**, treatment for, 2-410
- Aspirin**, 9-447; 10-550
- Ass**, 4-\*506, 508, \*509  
wild, 4-\*349, \*350  
*see also* Donkey
- Assai**, fruit, 9-194
- Assembly, National**, of France, 6-191
- Assembly, Roman**, 5-201
- Asser**, John, 6-137
- Assiniboine River**, Canada, 8-302
- Assisi**, Italy, church over tomb of Saint Francis, decoration, 11-110, 111, 119
- Associated Press**, 10-79
- Assuan Dam**, Egypt, *see* Aswan Dam
- Assumption, Fort**, Tenn., 8-367
- Assur**, chief city of Assyria, 5-88
- Assurbanipal**, *see* Ashur-bani-pal
- Assurnazirpal**, *see* Ashur-nazir-pal
- Asswan Dam**, *see* Aswan Dam
- Assyria**, description and history, 5-†88-92  
archaeology, 5-14  
architecture, 11-407; 5-14  
art, 11-†26-28  
mosaic inlay, 12-110  
relief sculpture, 12-\*106; 11-\*26, †27  
classification of peoples, 5-43  
collapse, 5-92  
control of Egyptian Delta, 5-69  
cruelty of people, 5-91; 11-26

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Assyria-- continued**

- headaddresses, 9-<sup>\*</sup>91, 94
- knowledge of glazing, 12-55
- knowledge of iron, 12-2
- library at Nineveh, 5-44
- maps, 5-<sup>\*</sup>48, <sup>\*</sup>88, <sup>\*</sup>100
- musical instruments, 12-<sup>\*</sup>202
- race: culture, 5-89
- relations with Babylon and Babylonia, 5-14, 89
- relations with Hittites, 5-89, 115
- rule over Hebrews, 5-126-29
- today turned to desert, 7-465
- victories and conquests, 5-89, 91
- war power, 5-91

*see also* Babylonia; Mesopotamia

**Assyro-Babylonian archaeology**

- Assyrian, 5-14
- Babylonian, 5-<sup>†</sup>11 fol.
- Chaldean, 5-<sup>\*</sup>11, 14, 11-24, 404, <sup>\*</sup>405
- Sumerian, 5-<sup>†</sup>11 fol., <sup>\*</sup>75, <sup>\*</sup>81

**Assyro-Babylonian architecture**

- Assyrian, 11-<sup>†</sup>407, 5-<sup>†</sup>4
- Babylonian, 11-<sup>†</sup>407-8; 5-<sup>\*</sup>86
- Chaldean, 11-404, <sup>\*</sup>405, 24, 5-<sup>\*</sup>11, 14
- Sumerian, 11-404, 407, 23, 25

**Assyro-Babylonian art, main article, 11-<sup>†</sup>22-29**

- Assyrian, 11-26-28; 12-110
- Chaldean, 11-28
- Persian, 11-<sup>\*</sup>27, <sup>†</sup>28-29
- Semitic, 11-<sup>\*</sup>22, 25
- Sumerian, 11-<sup>†</sup>23-24, <sup>†</sup>25, 5-<sup>\*</sup>77 12-79 fol., 109

**Assyro-Babylonian empires, maps, 5-<sup>\*</sup>88**

**Astatine, element, 1-<sup>†</sup>551**

**Asterias swallowtail butterfly, caterpillar, 3-<sup>\*</sup>283, <sup>\*</sup>381**

**Asteroids in solar system, 1-<sup>†</sup>5 fol., <sup>\*</sup>106, 152**

**Asters, flowers, 2-<sup>\*</sup>170**

**Astigmatism, cause and remedy, 1-438**

**Astor, John Jacob, fur trade, 7-231; 8-441**

**Astoria, Oregon, 8-330, 326**

Astor, 7-231

Salmon industry, 8-328

**Astrology**

- its one-time aid to science, 1-100
- Kepler's almanacs, 13-399
- signs of the zodiac, 1-<sup>\*</sup>170

**Astronomers**

**biographies, 13-<sup>†</sup>393-409**

- Brahe, Tycho, 13-<sup>†</sup>394-95
- Copernicus, Nicolaus, 13-<sup>†</sup>393-94
- Galileo, 13-396
- Halley, Edmund, 13-402
- Herschel family, 13-<sup>†</sup>403-5
- Kepler, Johann, 1-<sup>†</sup>288-90; 13-398
- Laplace, Pierre Simon, Marquis de, 13-<sup>†</sup>406
- Lowell, Percival, 13-<sup>†</sup>406
- earliest, 1-<sup>†</sup>99-103; 5-97
- Greek, 1-103, 169, 170; 5-160, 172; 13-<sup>\*</sup>2
- Ptolemaic astronomy with map, 1-<sup>\*</sup>101, 102, 177; 5-462; 13-393

**Astronomical clocks, 10-<sup>\*</sup>465, 468**

**Astronomical instruments, main article, 1-<sup>†</sup>185-91**

- made by Tycho Brahe, 13-395
- see also* Telescopes

**Astronomical observatories, *see* Observatories, astronomical**

**Astronomy, main article, 1-<sup>†</sup>99-191, (*see also* Contents Volume 1 for chapter headings and also main subjects listed below)**

- asteroids, 1-<sup>\*</sup>5, 6, <sup>\*</sup>7, 152
- color plate, 1-98
- aurora borealis (northern lights), 1-<sup>†</sup>526
- calendar, 10-<sup>†</sup>477 fol.
- comets, 1-<sup>†</sup>161-65, 167
- constellations, 1-<sup>\*</sup>170, 177, 204
- maps, color plates, 1-178-A-178-L
- cosmic rays, 1-351, 419
- distance, measurement of, 1-172
- early history, 1-<sup>†</sup>99-103
- earth, origin and formation, 1-<sup>†</sup>1-11
- earth's movement in space, 1-<sup>†</sup>13-16
- eclipses

moon, 1-125, <sup>†</sup>126

sun, 1-<sup>†</sup>116-18, <sup>†</sup>108

equinox and solstice, 1-<sup>†</sup>203

instruments used in study, 1-<sup>†</sup>185-91

longitude and time, 10-<sup>†</sup>470-73

meteors, 1-<sup>\*</sup>161, <sup>\*</sup>162, <sup>†</sup>164-67

Milky Way, 1-175, 176

moon, 1-<sup>†</sup>120-43

nose of, 14-412

nebulae, 1-<sup>†</sup>182-83

Nebular Hypothesis, 1-<sup>\*</sup>5, 6

observatories, 1-<sup>†</sup>185 fol.

photography, 1-188

planetarium, 1-<sup>†</sup>190-91

Planetesimal Hypothesis, 1-9

planetoids, 1-152

color plate, 1-<sup>\*</sup>98

**planets**

inner, 1-<sup>†</sup>145-52

outer, 1-<sup>†</sup>154-59

relative sizes, 1-<sup>\*</sup>16

precession of the equinoxes, 1-180

science of, altered by theory of relativity, 13-409

**solar system, 1-<sup>†</sup>1-11**

spectroscope, color plate, 1-186, 440-41

stars, 1-<sup>†</sup>169-80

color plate maps, 1-178-A-178-L

sun, 1-<sup>†</sup>108-18

relation of planets to, 1-<sup>†</sup>105-6

Thales' studies, 13-<sup>†</sup>2

tidal theory, 1-<sup>†</sup>7

tides, 1-9, 133, <sup>\*</sup>135, <sup>\*</sup>137; 9-440

time, 10-<sup>\*</sup>459-73

universe, 1-102, 176

chart, 1-<sup>\*</sup>179

zodiac, 1-177

*see also* Astronomers; Gravitation

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Astyages**, king of Media, 5-102
- Asunción**, Paraguay, ancient capital, 5-513  
temperature and precipitation, 5-518-G
- Aswan Dam**, Egypt, 1-\*366; 5-61, 73-B; 10-\*532
- Asylums**, insane, 7-\*441, 443
- Atabrine**, drug, 9-217
- Atahualpa**, Inca emperor, 5-497
- Atalanta and Hippomenes**, mythology, 14-†453
- "Atalanta in Calydon,"** by Swinburne, 13-259
- Atbara**, river, Africa, 5-473-A
- Atchafalaya Bayou**, La., 8-146
- Atchafalaya River**, Louisiana, length, 10-255
- Athabaska Glacier**, Columbia Icefields, 7-\*1
- Athabaska River**, Alberta, Canada, 10-253  
map, 7-592
- "Athaliah,"** oratorio by Handel, 12-265
- "Athalie,"** by Racine, 13-113
- Athanasius, Saint**, before Council of Nicaea, 12-365
- Athapascan Indians**, 8-317  
Oregon, 8-328
- Athena** (Minerva, Pallas Athene), goddess, 14-409  
aids Bellerophon, 14-445  
aids Perseus, 14-446  
contest with Poseidon, 5-\*152; 11-†420 fol.  
painting, 13-\*1  
punishes Arachne, 14-\*458, 459  
springs from brain of Jupiter, 14-\*406, 409  
statues, 14-\*410  
Athena of Lemnos, 11-\*42  
Capitoline Museum, 11-\*65  
Parthenon, 5-\*170; 11-45, 46, 423; 12-84,  
103  
temples  
at Priene, 11-\*421  
Parthenon at Athens, 11-44; *see also* Parthenon
- Athena Nike**, temple, 11-\*419, \*424  
carved relief, 11-\*42
- Athens**, Ga., university, 8-80
- Athens**, Greece (ancient), **description and history**, 5-159 fol., 166-73, 175, 176, 177  
**Age of Pericles**, 5-168 73; 12-†342-43  
allegorical painting of, 13-\*1  
architecture, *see* Acropolis; Parthenon  
art, *see* Greek art  
battle with Amazons, 4-425  
coins, 7-\*502  
contest of gods for possession of, 5-\*152  
description and life in, 5-169 fol.  
drama contest, 13-34, 35, 37  
education, 5-169  
schools, 5-170  
Academy, of Plato, 13-7  
Lyceum, of Aristotle, 13-9  
fortification, 5-166  
government  
democracy, 5-167, 172; 7-348  
judicial procedure, 7-†347  
ostracism, 5-160, †161  
Solon's reforms, 5-159-60; 12-337
- Athens** *continued*  
height of artistic genius, 5-176  
Hippocrates honored by, 13-358  
history, 5-159 fol., †166-73, 175, 176, 177  
escapes Dorian conquest, 5-153  
fall of, 5-173, 175  
Demosthenes' orations against Philip, 5-177; 12-345  
legendary founder, 13-35  
Peloponnesian Wars, 5-168, 173  
Persian Wars, 5-162-64; 12-339; 10-30  
Themistocles, 5-163, 166; 12-338-39  
leadership in Greece, 5-166, 172  
owl an emblem of, 13-1  
population; houses, 5-169  
Tower of the Winds, 10-461  
trade, 5-168  
tribute to Minos of Crete, 5-16; 14-447  
tyrants and kings, 5-159  
*see also* Greece, history
- Athens** (modern), Greece  
maps, 6-595, 571  
temperature and rainfall, 6-368-B  
war sufferers, 6-\*517
- Athens county**, Ohio, coal, 8-311
- "Athens, The Antiquities of,"** by Stuart and Revett, 5-18; 11-288
- Athlete**, various meanings of term, 14-471
- Athletics** (*see* Contents Volume 14 and also entries under the main subjects listed below)  
defined; history, 14-471
- games**  
baseball, 14-†503-8  
basketball, 14-†484-86  
boat races, 14-†530-33  
football, 14-†515-18  
golf, 14-†494-98  
handball, 14-486  
hockey, 14-†523-24  
lacrosse, 14-†493  
polo, 14-†525-26  
tennis, 14-†464-70  
major track and field sports, 14-†471 76  
Olympic games, 14-471  
stadiums, 14-\*517
- Athos**, character in "The Three Musketeers," 13-128
- Atkins**, inventor of raking machine, 10-413
- Atkinson, Sir Harry**, 5-540
- Atlanta**, Georgia, capital, 8-\*78, 83  
capitol building, 8-\*78  
captured by Sherman, 7-264, 265  
temperature, 8-84  
"Atlanta," cruiser, 6-\*534
- Atlantic**, locomotive, 10-\*191
- Atlantic cable**, main article, 10-†101-6  
how made, 10-103, 106  
laying of, 10-†104-6  
portraits of leaders in enterprise, 10-\*101, 102  
William Thompson's aid to, 13-391, \*392
- Atlantic City**, N. J., resort, 8-246  
salt-water taffy industry, 8-249

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Atlantic City** *continued*

temperature, 8-252

**Atlantic coastal plain**, 7-343-C

Alabama, 8-2

Delaware, 8-66-A

New Jersey, 8-252

New York, 8-283

Long Island, 8-268

North Carolina, 8-290, 296

sinking of, 8-64

Virginia, 8-418

**Atlantic islands**, *see* Atlantic Ocean, islands**"Atlantic Monthly, The,"** first editor of, 13-313**Atlantic Ocean**cables, *see* Atlantic cable

depth, 1-66

elevation under, between America and Europe, 6-483; 10-102

first airplane flights across, 10-320, 325

first wireless messages across, 10-116

fishing, 9-364 fol.

Gulf Stream, current, 1-67, 211, \*223

islands, 6-†482-92

West Indies, 7-†50-66

maps, 7-601, 591

map, 5-71

sea creatures, 3-113

size, 1-\*66

trade routes, 10-233-34

*see also* Ocean**Atlantic squid**, fish, 3-171**Atlantosaurus**, prehistoric lizard, 3-41**Atlas**, giant, mythology

and the golden apples, 14-429

earth supported by, 1-79, \*101, 102

turned into mountain, 14-447

**Atlas moth**, 3-288**Atlas Mountains**, in Northwestern Africa, 1-29; 5-452

Algeria, 5-473-C

map, 5-574

Morocco, 5-473-C

**Atmosphere**, nature of, main article, 1-216-20

clear, for astronomical observations, 1-183, 190

colors in sky due to, 1-270

conditions on moon of Mars, 1-151

currents, 1-†222-25, 399

dust is important, 1-219, 220, 377

**gases and other elements** in, 1-†372-77

heat in, 1-207

height, 1-217, 372

kites used in study of, 14-500

light diffused by, 1-140, 175, 176, \*177

**moisture** in, 1-†239-42, 407

moon has none, 1-138

of Venus, 1-148

primitive superstitions about, 1-372

refraction of light by, 1-\*424-26, 427, \*431

regions, 1-\*454

weight, 1-454, 472

*see also* Air**Atmospheric pressure**, and weather, 1-†258-61

changes with altitude, 1-456, 472

effect on eardrum, 2-304

normal force, 1-458

Pascal's studies, 13-108

per square inch, 1-67, 260, 287

relation to boiling point, 1-402, 404

*see also* Air pressure**Atolls**, coral, 1-57; 3-99; 5-521, 526, 529**Atomic bomb**, 1-†558-A-558-H; 6-555, 557, \*559

production plant at Oak Ridge, 7-\*527

**Atomic energy**, 1-†558-A-559**Atomic Energy Commission**, 7-381**Atomic energy control**, 6-557**Atomic numbers**, 1-551**Atomic theory**, 13-3

ancient, 13-2; 1-540

Dalton's, 1-283; 13-383

Democritus, 1-281, 532; 13-2

**Atomic weights**, 1-551, 554**Atoms**, structure and behavior, 1-†540-48

action, 1-2

and molecules, existence and behavior, 1-

†354-61, †543-48, 558-A-559

as conceived by Democritus, 1-532

development of matter from, 1-2

disintegration, 1-\*540, 541, \*542, †546

electrons and protons, 1-2, 284

enlargement, 1-\*2

meaning of word, 1-281

number of different kinds, 1-533

"shadows" seen under ultra-microscope, 10-490

size, 1-280

source of energy, 1-352

**Aton**, Egyptian deity, 5-64; 11-16**Atrium**, architecture, 11-†442, 454

in Roman house, 5-228

**Atropine** (belladonna), drug, 9-219**Atropos**, one of the Fates, 14-412**Attar of roses**, 9-†299-302**Attica**, city-state of ancient Greece, 5-153

on map, 5-\*150

*see also* Athens**Attila**, "the Scourge of God," king of the Huns, 5-270; 12-366

and Pope Leo I, 5-\*268

death, 5-270

invades Europe, 6-277

**Attlee**, Clement Richard, biography, 6-565**Attorney-General**, U. S., 7-378**Attu Island**, Alaska, 8-16**Auburn**, Maine, shoe factories, 8-154**Aubusson**, France, tapestry center, 12-144**Aubusson rug**, 12-161**Auchinleck**, Lord of, father of James Boswell, 13-195**Auckland**, New Zealand, former capital, 5-539

gold mines, 5-541-B

rainfall and temperature, 5-541-B

**Aud**, viking queen, 6-419**Auditory meatus** of ear, 2-\*284

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Auditory nerve**, 2-304
- Audubon, John James**, life and work, main article, 13-427-28; portrait, 13-\*427
- birds painted by, 4-84
- Baltimore oriole, 4-\*26
- barn swallow and nest, 4-\*33
- quoted, 4-147
- Audubon societies**, 13-428
- bird sanctuaries, 4-517
- color plates from, 4-\*24, \*25, \*88, \*89, \*120, \*152, \*184, \*185
- Aue, Hartmann von**, *see* Hartman von Aue
- Augean stables**, mythology, 14-428
- Augeas**, king, mythology, 14-428
- Auger**, tool, how to use, 14-†26
- Augsburg, Council of** 1530, 6-213
- Augsburg, League of**, 6-184
- Augsburg, Peace of**, 6-214
- Augsburg Confession**, 6-213
- Augury**, invented by Etruscans, 5-194
- August**, month, origin of name, 10-482
- Augusta, Georgia**
- captured by British, 8-79
- industries and commerce, 8-83
- Augusta, Maine**
- capitol building, 8-\*148
- industries, 8-154
- Augusta Bridge**, Utah, 8-396-A
- Augustan Age of Rome**, 5-†226-29; 12-363
- architecture, 11-428
- Augustine, Saint (of Canterbury)**, takes Christianity to Britain, 6-\*7, 9; 13-531
- Augustine, Saint (of Hippo)**, life and works, main article, 13-†531-33; 5-278
- Augustinians**, religious order, 5-278; 13-533
- Augustulus**, *see* Romulus Augustus
- Augustus (Gaius Julius Caesar Octavianus)**,
- first Roman emperor, life, main article, 12-†362-63
- Antioch beautified by, 5-4
- borne through streets in triumph, 5-\*228
- consul in Rome, 5-225
- declared a god, 5-236
- "golden milestone" set in Forum by, 10-151
- method of recruiting soldiers, 5-246
- month named for, 10-482
- Ovid banished by, 13-52
- portrait bust, 11-\*60
- reign, 5-†226-29, 231
- statues, 9-\*7; 11-69; 12-\*362
- of glass, 12-28
- victories commemorated in Altar of Peace, 11-64, \*68
- war with Cleopatra, 12-361
- writers encouraged by, 13-48 fol., 55
- Augustus, Square of**, Antioch, 5-\*3
- Auks**, bird family, 4-†204-8
- "Auld Licht Idylls,"** by Barrie, 13-268
- Aulos**, musical instrument, 12-239
- "Aunt Jo's Scrap Bag,"** by Louisa May Alcott, 13-321
- Aurangzeb**, Mogul emperor, 5-375, 378, 379
- Aurelian**, emperor of Rome, victories, 5-248
- Aurelius, Marcus**, *see* Marcus Aurelius Antoninus
- Aurelius Augustinus**, *see* Augustine, Saint (of Hippo)
- Aureomycin**, germ killer, 9-\*216
- Auricles of heart**, 2-372, \*374-75
- color plate showing circulation of blood, 2- frontispiece
- wall between ventricles and, 2-\*373
- Aurignacians**, people, in Wales, 6-137
- Aurochs**, animals, 4-390
- Aurora (Eos)**, goddess, 14-†414; 1-109
- and Cephalus, 14-434
- and Tithonus, 14-442
- mother of Winds, 14-433
- Aurora borealis** (Northern lights), 1-†526
- effect of sun spots upon, 1-116
- "Aurora Leigh,"** by Elizabeth Browning, 13-253
- Austen, Jane**, life and works, 13-†207-8
- Auster**, south wind, 14-433
- Austerlitz, Battle of**, 6-197
- Austin, Josiah**, teapot by, 12-\*91
- Austin, Stephen Fuller**, Texan patriot, 12-516
- Austin, Texas**
- capitol building, 8-\*376
- industries, 8-385
- Australia**, continent, main article, 5-†543-60,
- general data, 5-560-1-560-1
- see also* index World War II, 6-493
- aborigine, 5-\*545
- animals, 5-544, 560-J
- marsupials, 4-†459-72; 5-525
- Anzacs, 5-560-B
- art, 5-560-E, 560-G, 560-H
- boat racing, 14-533
- charted, 13-506
- claimed for England, 13-\*488, 490
- Commonwealth established, 5-560
- exploration and colonization**, 5-550, 552, 553
- colonies and early government, 5-†555
- Cook's exploration, 13-\*488, 489; 5-\*543, 547
- first governors of colonies, 5-\*554
- flag, color plate, 14-following 570, no government, 5-558, 560-I.
- Great Barrier Reef, 3-\*97, 1-57
- highest and lowest altitudes, 1-25
- immigration problem, 5-556
- industries, *see below*, products and industries
- irrigation, 5-557
- land question, 5-556
- libraries, 5-560-F, 560-G
- literature, 5-560-E 560-F
- maps, 5-600
- on map of World, 5-573
- music, 5-560-E
- Mount Kosciuszko, 1-\*26
- name adopted, 5-552
- native people, 5-†544, \*545, 560-K
- no pottery used by original inhabitants, 12-47
- penal colonies, 5-545 fol.

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Australia—continued**

- people, 5-543, 560-K
- products and industries, 5-560-Q
  - canning, 9-228
  - coal, 5-560-S
  - fruit growing, 5-560-S, \*557
  - government control of industry, 5-555, 556
  - mineral wealth, 5-560-S, \*556
  - olive growing, 9-213
  - pearl fishing, 3-163
  - poultry, 9-358
  - silver mining, 5-560-S; 9-\*388, 389
  - stock raising, 5-549, 560-Q; 9-75, 76, 77, 81
  - timber, 5-560-T, \*549
  - wheat raising, 5-\*560-B, 560-R; 9-98
  - wool, 9-75, 76, \*80
- since gold discovery, 5-†553-60
- social legislation, 5-560-A, 560-N
- trade
  - beef export, 9-329
  - depression, of 1890's, 5-557
  - during gold rush, 5-554
  - export and import goods, 10-240
  - wool, 9-75, 76
- trade route to, 10-238
- transportation, 10-185, 224, 267
- War costs, World War I, 5-560-B
- World War I, 5-560-A, 560-B
- World War II, 5-560-C

**Australian Alps, 5-544****Australian and New Zealand Army Corps (Anzacs), 5-560-B****Australian Art, 5-560-E, 560-G, 560-H****Australian bear (koala), 4-\*466, 467****Australian crane, bird, 4-\*105****Australian literature, 5-560-E, 560-F****Austria, country, Europe, description and history,**

- main article, 6-†256-75, general data, 6-265,
- see also index World War II, 6-493

**area, 6-265****arms and armor, 10-\*355, \*359****art**

- carving, 12-\*101

- porcelain, 12-60

**birth of, at close of World War I, 6-257****climate, 6-265****common people, 6-\*259, 260, 269 fol., 275****flag, color plate, 14—following 570, no. 5****general characteristics, 6-257****government, 6-265**

- constitutions, 6-269, 270, 271

**history**

- to 1792, 6-†256-65

- struggles with Switzerland, 6-247-50
- under Babenbergs, 6-258
- Hapsburgs, rise of, 6-259
- as head of Holy Roman Empire, 6-263
- acquires part of Burgundy, 6-176
- rules in Hungary, 6-282-86, 288
- wars with Turkey, 5-412
- Thirty Years' War, 6-263

**Austria, history—continued**

- conflict between Hapsburgs and Hohen-zollerns, 6-218
- relations with France, 6-181, 186, 192, 194
- War of the Austrian Succession, 6-186, 220, 264; 5-381
- Seven Years' War, 6-221, 264
- relations with Prussia, 6-220 fol.; 12-448-49
- partitions of Poland, 6-225, 451, 452,
- since 1792, 6-†267-75
- Napoleonic Wars, 6-267; 12-†424 fol.
- attempts to prevent spread of democratic ideas, 6-268
- revolutions in Bohemia and Hungary, 6-269
- Seven Weeks' War, 6-227, 229
- war with Denmark, 6-416
- Holy Roman Empire dissolved, 6-268
- forced out of German Confederation, 6-271
- dual monarchy established, 6-271, 288; see also Hungary
- Triple Alliance, 6-273, 309
- influence in the Balkans, 6-357, 358, 363
- assassination of Archduke Ferdinand; beginning of World War I, 6-274, 363
- invasion of Serbia, 1914, 6-363
- World War I, 6-235, 274
- territory lost to Yugoslavia, 6-364
- republic formed, 6-275
- Schuschnigg becomes dictator, 6-275
- annexation by Germany, 6-241
- importance of location to growth, 6-260
- Italian possessions, 6-303, 305 fol.
- language, 6-257
- location, 6-265
- maps, 6-587
- on map of Europe, 6-570
- music and musicians, 12-233, 237, 243, †266, †270, 273, †283; see also Germany, music and musicians
- origin of name, 6-258
- peasant costume, 9-\*2
- people, 6-265, 258, 260, 272
- physical features, 6-265
- provinces, 6-265
- Reformation, 6-259, 261
- remains of early civilization found in Hallstatt, 6-\*257, 258
- river transportation, 10-259
- silk production, 9-38
- treatment of Jews, 5-138
- Austria-Hungary, dual monarchy, 6-271-74, 286, 288**
- dual monarchy formed, 6-271, 288
- progress in liberal government and learning, 6-273
- relations with Russia, 6-273
- Triple Alliance, 6-273
- voting for men, 6-273
- World War I, 6-274, 288

- Austria-Hungary**—*continued*  
*see also* Austria; Hungary  
**Austrian Succession, War of the**, 6-264, 186, 220  
in India, 5-381  
**Authorized Version of the English Bible**, *see*  
Bible, King James (Authorized) Version  
**Authors**, biography  
*for the world's greatest writers see literary*  
*biographies listed in Volume 13*  
**Auto State**, nickname for Michigan, 8-186 B  
**Auto-intoxication**, cause of, 2-367  
**"Autobiography,"** by Herbert Spencer, 13-25  
**"Autobiography"** of Benvenuto Cellini, 12-88  
**"Autobus,"** meaning of term, 10-22  
**"Autocrat of the Breakfast Table, The,"** by  
Oliver Wendell Holmes, 13-309  
**Autogiro**, flying machine, 10-\*328-N  
**Automatic heating system**, 1-476, †477  
**Automatic pistol**, 10-364, 368  
**Automatic refrigeration**, 1-477  
**Automatic scales**, 10-†372  
**Automatic water heater**, 1-†477  
**Automobile**, meaning of word, 10-22  
**Automobile accident**, first aid hints, 2-†399;  
*see also* Driving  
**Automobiles**, main article, 10-†277-91  
accidents and safety precautions, *see* Auto-  
mobile accident; Driving  
**"Bluebird,"** racing car, 9-\*412  
Bonneville Salt Flats, races, 9-\*412  
brakes, 10-\*291  
bungalow built on chassis, 1-\*335, 336  
chemist's contribution to industry, 10-547-48  
clutch, 1-†318  
driving, *see* Driving  
earliest, 10-†278, \*280  
engine and its mechanism, 10-†282-91  
force that moves, 1-†287  
forerunners, 10-277  
industry in U. S., 10-279  
\* California, 8-40  
factory, 7-†558  
Indiana, 8-114  
manufacturing methods, 7-566, \*567  
Michigan, 8-179, \*184, 185  
Ohio, 8-\*308  
Wisconsin's manufacture, 8-444  
lubrication, 10-288  
modern types, 10-\*277, \*279, 281  
motorbus, 7-†399; 10-\*279, 281  
odometer, 10-\*440  
road building for use of, 10-156  
speedometer, 10-\*440  
stalling, reason for, 1-307, 312  
stream-lining, 10-\*277  
taxes, 7-389  
tires, 9-†270, \*260  
toy, how to make, 14-†38  
training cars, 2-447  
transmission, 1-331  
welding of steel parts, 1-†513  
why low price is possible, 7-539
- Autonomous republic**, meaning, 6-443-B  
**Autoplate machine**, 10-82  
**Autumn**, season, 1-206, 210  
sun's position during, 1-†111  
**"Autumn Leaves,"** by Victor Hugo, 13-125  
**Autumnal equinox**, 1-203  
**Autun**, France, cathedral, capitals, 11-\*86  
**Avalanche**, defined, 1-63  
**Avalon**, island, disputed burial ground in Arthur-  
rian romances, 14-404  
**"Avanti,"** socialistic paper, 6-310  
**Avaricum**, ancient Gaul, metal work, 12-6  
**Avaris**, Egypt, capital of the Hyksos, 5-61  
**Avars**, people, in Hungary, 6-277  
**Ave Maria**, early name for Cuba, 7-56  
**Avery, John** (Bridgeman), pirate, 10-170  
**Aviation**, main article, 10-†312-28-V  
chemistry's contributions, 10-548  
in warfare, 10-†364  
service to archaeology, 5-21  
thermometer used in, 1-391  
use of photography, 10-452; 5-432  
*see also* Aircraft; Airplanes; Flying  
**Aviators**  
airline pilots, 10-328-D-F  
avoid storm centers, 1-248  
famous flights and flyers, 10-318 fol.  
fog dangers, 1-242  
licenses, 10-328-D-F  
sense of balance, 2-\*283, 284  
weather reports for, 1-276, 278  
**Avignon**, France, popes at, 5-283, 298; 6-170, 300  
**Avila**, Spain, 5-\*309  
**Aviz**, house of, 6-340  
**Avocado**, alligator pear, 9-194, \*195  
**Avocets**, birds, 4-\*100, 104, 118  
**Avogadro, Amadeo**, molecule defined by, 1-283  
**Avoirdupois weight**, 10-375  
**Axe**, tool, 12-\*3; 14-559  
**Axe heads**, viking, 12-\*16; prehistoric, 11-\*2  
**Axenstrasse**, road, Switzerland, 10-\*203  
**Axil**, of plant, 2-132  
**Axillary bud**, of plant, 2-\*48, †132  
**Axis**, of earth, 1-201, 203  
**Axis deer**, 4-\*402, 412, \*413  
**Axles**, invention of, 10-144  
*see also* Wheel and axle  
**Axminster rug**, 12-161  
**Axolotl**, salamander, 3-\*430, 431  
**Ayacucho, Battle of**, 5-506  
**Aye-aye**, monkey, 4-†269  
**Ayesha**, wife of Mohammed, 5-398  
**Ayotla, Revolution of**, Mexico, 7-84  
**Ayr**, Scotland, Black Parliament held at, 2-381  
**Ayrshire cattle**, 9-332, \*333  
**Azaleas**, shrubs, structure, 2-172  
**Azana, Manuel**, premier of Spain, 6-335  
**Azara's dog**, 4-\*307  
**Azei**, wild bird, 9-351  
**Azerbaijan**, republic, U.S.S.R., 6-368, 443-B  
Baku oil fields, 6-368

The asterisk (\*) refers to picture and its explanation only. Th= obelisk (†) refers to illustrated text.

**Azores**, islands, Atlantic Ocean, description and history, 6-489  
 caves, 1-86  
 map, 6-590  
 • Portuguese colonization, 6-341  
**Azov, Sea of**, arm of Black Sea, Russia  
 maps, 6-601  
 on map of Europe, 6-571  
**Aztec Ruins National Monument**, 8-262-A

**Aztec State**, nickname for Arizona, 8-24-A  
**Aztecs**, Indians, history and civilization, 7-†70-76, 91  
 calendar, 10-\*477  
 conquered by Cortes, 13-468-69; 7-118  
 message bearers, 10-30  
 present day, 7-\*73  
 snowshoes, 9-60  
 splendor of cities, 5-19



**B.C.**, meaning of, 10-476  
**B.T.U.** (British Thermal Unit) of heat energy, 1-407  
**Baal**, god, worship of, 5-120, 125, 126  
**Baalbek**, Syria, Roman temple, 11-62  
**Baalith**, goddess, 5-120  
**Babassú**, oil, 9-190  
**"Babbitt,"** by Sinclair Lewis, 13-351  
**Babcock, J. C.**, racing shells improved by, 14-532  
**Babcock, S. M.**, 9-342  
**Babel, Tower of**, 11-†406; 10-\*5  
 successor of, discovered, 5-13, 16  
**Babenberg**, princely family of Franconia, rule in Austria, 6-258  
**Baber, Zahir ed-Din Mohammed**, founds Mogul empire in India, 5-374  
**"Babes in the Woods,"** fairy tale, text, 14-†179-81  
**Babiroussa**, animal, 4-\*433, 434  
 tusks, 2-314; 4-434  
**Baboons**, monkeys, 4-†258-60  
**Babuyan Islands**, Pacific Ocean, map, 8-594  
**Baby**  
 necessity for crying, 2-287  
 safety training, 2-428-29  
 soft spot in skull, 2-324  
 teething, 2-314  
**Baby bonds**, 7-529  
**Baby carriages**, manufacture, 12-\*134  
**Baby State**, nickname for Arizona, 8-24-A  
**"Baby Stuart,"** painting by Van Dyck, 11-\*225  
**Babylon**, ancient city of Babylonia, description and history, 5-†85-87, 88 fol.  
 Amorite rule, 5-82, 85  
 Assyria: relations with, 5-14, 89, 91  
 conquered by Alexander the Great, 12-349  
 education, 5-86, 87  
 excavations, 5-\*13  
 lion unearthed, 5-\*89  
 gate of Ishtar, 5-95, \*97; 11-28  
 Hanging Gardens, 5-185, \*186; 9-96; 11-†408  
 location, 5-\*76  
 Nebuchadnezzar's capital, 5-95  
 Persians destroy, 5-\*95, 102  
 Procession Street, 11-28  
 enameled lion, 12-\*63  
 Sennacherib destroys, 5-91

#### Babylon- continued

splendors, 11-28  
 temple, 5-\*86  
**Babylonia**, ancient country, Asia, description and history, main article, 5-†84-97  
 architecture; archaeology, 11-†407-8; 5-\*11  
 art, 11-\*22, 25-26, 28, 29  
 astronomy in, 1-100  
 calendar, 10-481  
 center of Jewish learning, 5-133  
 classification of peoples, 5-43  
 cuneiform writing and inscriptions, 10-\*34, 43, 44, \*74; 5-†87, 104; 12-\*106; 9-\*276  
 glazing, knowledge of, 12-55  
 Hammurabi's law code, 5-86  
 history  
 first Babylonian empire, 5-†84-92  
 Chaldean or second Babylonian empire, 5-†94-97  
 Semitic rule, 5-82  
 Assyrian conquest, 5-89  
 name changed to Chaldea, 5-95  
 Persian conquest, 5-97  
 Trojan's conquest, 5-240  
 iron, knowledge of, 12-2  
 language, on Behistun Rock, 5-104  
 legends, compared with Jewish history, 5-119  
 library, 10-556  
 location, 5-†88  
 maps, 5-\*88, \*100  
 marriage customs, 5-\*85  
 numerals, 10-421  
 today turned to desert, 7-465  
*see also* Assyria; Chaldea; Mesopotamia; Sumeria  
**Babylonian Captivity**, of Jews, 5-96, 127  
**"Babylonian Captivity,"** of popes, 5-298; 6-170  
**"Babylonian Marriage Market,"** 5-\*85  
**"Bacchae, The,"** by Euripides, 13-38  
**Bacchus** (Dionysus), god, 14-411  
 and Ariadne, 14-448  
 dance in honor, 12-\*203, 204  
 dramas written for festivals, 13-33-34, 35; 12-324  
 gives golden touch to Midas, 14-460  
**Baccio della Porta**, *see* Bartolommeo di San Marco, Fra

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

- Bach, Johann Sebastian, life and work, main article, 12-261-63**  
 lute written for, 12-258-D  
 music, 12-229-32  
 portraits, 12-\*241, \*262  
 score and signature, facsimile, 12-\*231  
 works revived by Mendelssohn, 12-288
- Bach, Karl Philipp Emanuel, father of the sonata, 12-234**
- Bachelor seals, 4-329**
- Bacillus**  
 in milk, 2-20; 10-\*489  
 microorganism, 2-†14, 15, 16  
*see also* Bacteria
- Back swimmers, 3-†403**
- "Back to Methuselah," drama by George Bernard Shaw, 13-272**
- Back-yard fun, 14-†6, †43**
- Backbone**  
 beginnings, 3-12, 15, 19  
 birds most active of backbone animals, 4-57  
 fishes, 3-196  
 human, 2-319, \*322, \*393, \*396  
   color plate, 2-†278  
   connection with brain, 2-\*385  
 snake, 3-482  
 vertebrates, 3-68
- Backbone Mountain, Maryland, 8-162-A**
- Backbone Region, Ohio, 8-307**  
 wheat center, 8-309
- Backs River, Canada**  
 length, 10-253  
 map, 7-592
- Bacon, Francis, Baron Verulam, Viscount St. Albans, life and work, main article, 13-†150-52**  
 first essays written in English, 13-152  
 portrait, 13-\*151  
 use of Latin, 5-280
- Bacon, Henry, 11-521**
- Bacon, Nathaniel, rebellion against government of Virginia, 8-410**
- Bacon, Roger, the father of science, life, main article, 13-†374-76**  
 discovers gunpowder, 10-416
- Bacon's Rebellion, 8-410**
- Bacteria, microorganisms, main article, 2-†12-21**  
 as scavengers, 2-17, 18  
 beneficial, 2-18-21  
 Brownian movement, 2-15  
 cheese making, 9-346  
 coal formed with aid, 9-437  
 decomposition due to, 2-16, \*17, 18  
 disclosed by microscope, 10-486 fol.  
 disease caused by, 2-†12 fol.  
 eggs, 9-357  
 enzymes secreted, 2-53  
 filtered from water supply, 10-542  
 food, 9-226; 10-516  
 habitat, 2-14, 15  
 kinds, 2-14  
 laboratory for study, 13-\*370
- Bacteria—continued**  
 lactic acid, 2-20  
 Leenwenhoek's discoveries, 13-363  
 legume roots bear, 10-546  
 locomotion, 2-15  
 luminescence, 2-17  
 luminous, on fungi, 2-72  
 meat, 9-326  
 milk, 2-20; 9-341; 10-\*489  
 nitrogen given to soil by, 1-538  
 on needle, 2-\*291  
 on pencil tip, 2-\*349  
 on teeth, 2-312, 315  
 one form able to live without oxygen, 1-374  
 pasteurization destroys, 13-367  
 plant diseases caused by, 2-137  
 reproduction, 2-16  
 rocks crumbled by action of, 2-20  
 shapes, 2-†14  
 silage, 2-20; 9-335  
 Spallanzani's discoveries, 13-371  
 sterilization destroys, 9-226  
 structure: size, 2-12  
 symbiosis with pea family enriches soil, 2-58, 168  
 temperature adaptable to surroundings, 2-15  
 weight, 2-13  
*see also* Bacillus; Fungi, Germs
- Bacteriology, 2-4**
- Bactrian camel, 4-\*397, 398, \*400**
- Bad Axe River, massacre, 7-474**
- "Bad Lands," section of U. S., 8-299, 359, †360**  
 grazing, 8-301  
 national monument, 8-364-A  
 Nebraska, 8-222, 228
- Bad Lands National Monument, 8-364-A**
- Baden, state, Germany, map, 6-582**
- Baden-Baden, Germany, mineral springs, 1-90**
- "Baden Baden," rotor ship, 1-\*508**
- Baden-Powell, Agnes, outlines Girl Scout organization, 14-\*546**
- Baden-Powell, Robert, Lord**  
 founds Boy Scout movement, 14-542  
 organizes Girl Scouts, 14-546  
 portrait, 14-\*541
- "Badge of shame" of Jews, 5-135, 138**
- Badger, animal, 4-†360**
- Badger State, nickname for Wisconsin, 8-446-A**
- Badgers, nickname for people of Wisconsin, 8-446-A**
- Badon, Mount, England, battle at, 14-377**
- Baekeland, L. H., 9-446, 10-552**
- Baffin, William, 13-496**
- Baffin Bay, No. Amer., discovery, 13-496**  
 icebergs, 1-63  
 maps, 7-590, 593
- Bagasse, sugar cane product, 9-114**
- Baggage, handling of, on steamers, 10-294, 295**
- Baghdad, Irak, capital of Moslem Empire, 5-398**  
 port, 10-237
- Bagne'l Dam, in Missouri, 8-\*209**  
 artificial lake formed by, 8-212-A

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Bagobos**, Philippine tribe, 5-<sup>\*</sup>562, <sup>\*</sup>563, <sup>\*</sup>566
- Bagpipe**, wind instrument, 12-258-C; 6-<sup>\*</sup>130  
Bible mentions, 12-204  
forbidden in Scotland, 6-132
- Bags**, jute, 9-310
- Bagworm**, 3-293
- Bahama Islands**, Atlantic Ocean, description, 7-53, 54-A, 54-B  
coral formation, 3-99  
flamingo colony, 4-<sup>\*</sup>197  
map, 7-600  
sponge fisheries, 7-<sup>†</sup>52
- Bahia**, Brazil  
commerce, 10-241  
oranges, 9-175
- Bahr el Ghazal**, river, Africa, 5-473-A
- Bahrein**, British protectorate, Asia, 5-336-D
- Baikal, Lake**, Eastern Siberia, 5-464; 6-443-A  
prehistoric topography, 5-336-D
- Bailey**, Harry, in "Canterbury Tales," 14-329
- "Baillie Family, The,"** by Gainsborough, 11-<sup>\*</sup>299
- Bails**, used in cricket, 2-<sup>\*</sup>360
- Baird**, John Logie, work in television, 10-124
- Baird Mountains**, Alaska, 8-16
- Baird's tapir**, animal, 4-348
- Baked Bean State** (Massachusetts), 8-176-B
- Baked Beans**  
canning of, 9-<sup>\*</sup>228  
New England, 8-176-B  
used by campers, 14-<sup>\*</sup>553, 554
- Bakelite**, substitute for hard rubber, amber, and celluloid, 9-446; 10-552
- Baker**, Abigail Ambrose, mother of Mary Baker Eddy, 13-555
- Baker**, Albert, brother of Mary Baker Eddy, 13-555
- Baker**, George Pierce, Professor, Harvard's 47 Workshop started by, 13-354
- Baker**, Julie Stevens, song by, 8-212-B
- Baker**, Mark, father of Mary Baker Eddy, 13-555
- Baker**, Mary Morse, *see* Eddy, Mary Baker
- Baker**, Newton D., in Wilson's cabinet, 12-549
- Baker**, Ray Stannard, 7-308
- Baker**, Sir Samuel, government of the Sudan, 5-455
- Baker**, Mount, Washington, 7-<sup>\*</sup>408
- Baker Island**, Pacific Ocean, 8-466
- Bakeries**, main article, 9-<sup>†</sup>238-43  
community bakehouses, 9-240, <sup>†</sup>241  
public bakeries, ancient, 9-240
- Baking**, process, 10-550
- Baking powder**, 10-550
- Bakony Forest**, mountains, Western Hungary, 6-290-B
- Baku**, Azerbaijan, U.S.S.R., 6-368; 10-261  
Revolutionary center, 12-449-F  
Trans-Iranian railway, 10-262
- Balaclava**, Battle of, Russia, 13-249
- Balakirev**, Mili Alekseyevich, member of "The Five" musical coterie, 12-313
- Balance**, constellation, *see* Libra
- Balance**, sense of, main article, 2-<sup>†</sup>282-85, 296  
canals in the ear which give, 2-282, <sup>\*</sup>303
- Balance of power**, 5-414; 6-103
- Balance of trade** and shipment of gold, 7-513
- Balances and scales**, main article, 10-<sup>†</sup>370-71, 373-77
- Balata**, substitute for gutta-percha, 9-309
- Balboa**, Vasco Nunez de, life and explorations, main article, 13-<sup>†</sup>458-59  
claims Pacific for Spain, 7-117; 13-459
- Bald cypress**, tree, 2-<sup>\*</sup>268
- Bald eagle**, bird, 4-<sup>†</sup>151-52, color plate, <sup>\*</sup>152
- Bald-faced hornets**, 3-<sup>\*</sup>296
- Baldpates**, dabbling ducks, 4-118
- Baldwin I**, emperor of Constantinople, 5-409
- Baldwin I**, king of Jerusalem, 5-283
- Baldwin**, Abraham, 12-<sup>\*</sup>496
- Baldwin**, Robert, biography, 13-<sup>†</sup>566-67  
portrait, 13-566
- Baldwin**, Stanley, English premier, 6-108  
hated by Churchill, 12-449-C
- Balearic Islands**, Mediterranean Sea, 6-<sup>†</sup>471  
map, 6-591
- Baleen**, whalebone, 4-445
- Balfour**, Arthur, British premier, 12-449-B
- Bali and Lombok province**, Dutch East Indies, 5-529-B
- Baliol**, *see* Balliol
- Balkan Entente**, 6-362
- Balkan Mountains**, 6-368-A  
map, 6-594
- Balkan Peninsula**, Europe, 6-357, 315  
Italian ambitions in, 6-315  
history of the states, 6-<sup>†</sup>360-68  
Albania, 6-366  
Bulgaria, 6-<sup>†</sup>362, 364  
revolt against Turkey, 5-414  
Romania, 6-<sup>†</sup>360  
Serbia, 6-363  
united, 6-273, 274  
Yugoslavia, 6-364  
hungry children begging, 6-<sup>\*</sup>559  
maps, 6-595, <sup>\*</sup>360  
on map of Europe, 6-571  
Mohammedanism 6-357, 364, 366  
*see also* Greece; Turkey, European
- Balkhash**, Lake, Soviet Russia, Asia, 6-443-A
- Ball**, Jonn, leads Peasants' Revolt, 6-32
- Ball**, carved concentric sphere, 12-98
- Ball**, golf, 14-495; 9-309
- Ball**, rubber, used by Indians, 9-<sup>†</sup>261
- Ball and claw foot**, furniture, 12-<sup>\*</sup>191
- Ball and socket joints**, anatomy, 2-<sup>\*</sup>320, 324
- Ball bearings**, principle of, 1-<sup>†</sup>319
- Ball-flower**, ornament, 11-<sup>†</sup>474
- Ball**, games played with  
baseball, 14-<sup>†</sup>503-8  
basketball, 14-<sup>†</sup>484-86  
billiards, 14-<sup>†</sup>477-82  
bowls, 14-<sup>†</sup>492  
cricket, 2-360  
football, 14-<sup>†</sup>515-18

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Ball, games played with—continued**

- golf, 14-†494-98
- handball, 14-486
- hockey, 14-†523-24
- lacrosse, 14-†493
- polo, 14-†525-26
- tennis, 14-†464-70
- Ball lightning**, 1-248
- Ball python**, serpent, 3-\*494
- Ballance, John**, New Zealand, premier, 5-540
- Ballarat**, Australia, rebellion of 1854, 5-558
- goldfields, 5-557
- Ballast**, 10-233
- Ballet**, in opera, 12-227
- Balliol, Edward de**, appointed king of Scotland, 6-116
- Balliol, John de**, king of Scotland, 6-113
- Ballista**, war machine, 10-\*357
- Balloon race**, 1-\*473
- Balloons**, airships, 10-314, \*319
  - ascent in Antarctic region, 13-510
  - efforts to reach North Pole by, 13-501
  - first passengers, 1-468
  - for study of atmosphere, 1-\*259, \*278
  - gases used to inflate, 1-473
  - heights attained, 1-\*454
  - Montgolfier brothers first to construct, 1-467, 473; 10-314
  - Piccard's ascent, 10-314, 325
  - principle of ascent, 1-†468, 469, 483
  - sounding, 1-372
  - Weather Bureau work, 1-\*259, \*278
  - World War I, 7-\*327
  - see also Airships; Dirigibles
- Balloons**, toy, things made from, 14-†7
- Balmung**, sword of Siegfried, 14-\*310, 311
- Baloo bear**, 4-318
- Balsa**, boat, 5-\*499
- Balsa**, raft, 10-\*136, 137
- Balsa-wood**, 5-518-B
- Balsam**, tree, 2-159, \*213
- Balsam of Peru**, medicinal plant, 9-219-A
- Balthazar**, Wise Man, before the infant Christ, 5-\*101
- Balthazar Carlos, Don**, prince of Spain, portraits by Velasquez, 11-\*250, \*253, 257
- Baltic republics**, Europe, main article, 6-†459-64
- map, 6-601
- Baltic Sea**, Europe
  - amber from region of, 9-314
  - fresh-water lake at one time, 6-371
  - link with White Sea, 10-261
  - maps, 6-597, 570
  - on map of World, 5-573
  - rising of coast, 1-70
- Baltic-White Sea waterway**, 10-261-3
- Baltimore, Cecil Calvert**, Lord, Maryland given to, 7-130; 8-158
- Baltimore, George Calvert**, Lord, 8-158
- Baltimore, Md.**, 8-160
- first telephone message, 8-162-B

**Baltimore—continued**

- quay port, 10-246
- statue of Francis Scott Key, 7-\*413, 414
- Baltimore and Ohio Railroad**
  - "Fair of the Iron Horse," at Baltimore, 10-183
  - first railway and equipment, 10-\*182, 183, †188, \*191
  - West Virginia, 8-434
- Baltimore oriole**, bird, 4-\*26, †27
  - color plate, 4-\*89
  - Maryland's state bird, 8-162-B
- Balto**, Eskimo dog, 10-130
- Baluchistan**, country, Asia, map, 5-585
- Balzac, Honoré de**, life and works, main article, 13-†127-28
- Bamba**, native dance, 8-470
- "Bambino,"** by Luca della Robbia, 11-\*131
- Bamboo**, grass, 2-†179-80
  - uses, 2-180
  - basket making, 12-134
- Bamforth Lake Migratory Bird Refuge**, 8-454-A
- "Banana Islands,"** in the Caribbean Sea, 7-\*59
- Bananas**, main article, 9-†180-83
  - industry, 9-180 fol.; 7-41, 46, \*48
  - preservation and transportation, 9-181, \*182, \*183; 7-\*59
  - transportation on Canary Islands, 10-\*132
  - rafts made from stems of plants, 10-137
  - size of leaf of plant, 2-252
  - varieties, 9-183
  - where grown, 9-180; 7-\*41, 45, 46
  - wild, Manila hemp obtained from, 9-282, 285
- Banat region**, Roumania, coal, 6-368 B
- Bancroft, George**, founds U. S. Naval Academy, 7-488-C
- Band**, music, seating and marching arrangements, 12-\*248
- Banda Sea**, East Indies, map, 5-597
- Bandages**, how to make, 2-\*401, \*403, \*405, \*407, 411-12
  - sling, 2-\*411
  - sphagnum moss used for, 2-85
- Banded anteater**, 4-\*451
- Banded curassow**, bird, 4-\*78
- Banded iguana**, lizard, 3-453
- Banded opossum**, 4-\*468
- Bandelier National Monument**, 8-262-A
- Bander**, monkey, 4-257
- Bandicoot**, animal, 4-\*464, 465
- Bandy**, English hockey, 14-523
- Banff National Park**, Canada, 7-23, 29-V, \*33-J
  - color plates, 7-\*23
- Bangka**, island, East Indies, 5-529-B
- Bangkok**, capital of Siam, 5-428, 429
  - rainfall and temperature, 5-430-A
- Bangor**, Maine
  - factories, 8-154
  - largest timber port, 8-153
- Bangweulu**, lake, Africa, lake dwellers on, 5-467
- Banjo**, musical instrument, 12-258-C
- Bank**, see Banks and banking

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Bank**, rowers in galley, 10-163
- Bank of England**, Threadneedle Street, London, 6-†77
- Bank of the United States**  
established, 7-194  
President Jackson's opposition to, 7-226  
rechartered, 7-215
- Banka**, *see* Bangka
- Banked road**, 2-440
- "Bankruptcy, The,"** play, by Bjornstjerne Björnson, 13-99
- Banks, Sir Joseph**, aided settlement of New South Wales, 5-547, 548
- Banks and banking**, functions and services, 7-†516-23  
a bank's profit, 7-517  
check and checking account, 7-†518  
Chinese, 7-507  
bank note, 7-†507  
clearing house, 7-519  
credit and loans, 7-516-17, 520  
crisis of 1933; U. S. "bank holiday," 7-341  
Federal Reserve System, 7-315  
Glass-Steagall bill, 12-456-1)  
government regulation  
international, 7-511  
Middle Ages, 5-298  
paper money, 7-508  
Post Office banking service 10-91  
promissory note, 7-†521  
relation with farmers, 7-459  
Roman, 5-242  
savings, 7-516, 521  
started by Italian guilds, 6-297  
vaults, 7-†520, †522  
*see also names of banks, as Bank of the U. S.*
- Banner State**, 8-386-A
- Bannock Indians**, Montana, 8-216
- Bannockburn, Battle of**, 6-115; 12-384
- "Banqueters, The,"** by Aristophanes, 13-39
- Bantam**, breed of chicken, 9-†353, †350
- Banting**, ox, 4-†392, †395
- Bantus**, African Negroes, 5-445, 478
- Banyan tree**, 2-†35
- Baobab**, plant, 5-473-B
- "Baptism of Christ"** painting by Verrocchio, 11-†153
- Baptistry**, architecture, 11-443
- Baptistry** (cathedral of Bel San Giovanni), Florence, 11-124  
contest for doors, 11-125  
Ghiberti's doors, 12-22, †23; 11-†127, 128
- Barangay**, Philippine community, 5-563
- Baranof, Alexander Andreevich**, director of Russian-American Company, Alaska, 8-11
- Barbados**, island, West Indies, description, 7-54-B, 66  
map, 7-601  
sea creatures in waters of, 3-80
- Barbarians**, meaning, 5-42  
advanced civilization of northern barbarians, 12-14
- Barbarians—continued**  
invaders of Roman Empire; Middle Ages, 5-†262, 266-71; 6-258  
iron, knowledge of, 12-4 fol.  
Italy and Spain, 6-319  
*see also names of barbaric tribes, as Huns; Ostrogoths; Visigoths*
- Barbary ape**, 4-258
- Barbary Coast**, Africa, main article, 5-†450-55  
pirates, 5-454; 9-206; 13-76  
political divisions, 5-455
- Barbary sheep**, 4-†426
- Barbed wire entanglements**, 7-†321; 10-361
- Barbels**, feelers of fish, 3-242, 245
- "Barber, Barber, Shave a Pig,"** nursery rhyme, 14-174-D
- "Barber of Seville, The,"** opera by Rossini, 12-253
- "Barber of Seville, The,"** play by Beaumarchais, 13-121
- Barberry**, shrub  
pollinated by bees, 2-108  
stipules, 2-24
- Barberry rust**, 2-†140; 9-101
- Barbers as surgeons**, 13-364
- Barbet**, bird, 4-†184
- Barbican**, of castle, 11-457
- Barbizon school of landscape painting**, 11-333
- Barbuda**, island, West Indies, 7-63
- Barcelona**, Spain  
location by Lat. and Long., 6-342-A  
name, 6-319  
transportation of goods, 10-259
- "Bard, The,"** by Thomas Gray, 13-203
- Bards**  
Irish, 6-144  
Welsh, 6-†136, 139 fol.
- Barents Sea**, Arctic Ocean, map, 5-573
- Barezzi, Margarita**, wife of Verdi, 12-299
- "Baring, Miss,"** portrait by Lawrence, 11-†303
- Baritone oboe**, musical instrument, 12-258-A
- Barium**, element, symbol, atomic no. and wt., 1-†551
- Bark**  
oak root, 2-38  
trees, 2-†29, 30, †266-76
- Bark, sailboat**, 10-171
- Barkantine**, sailboat, 10-171
- Barking deer**, 4-413
- Barkley, Alben William**, 12-456-F
- Barley**, grass, 9-†119; 2-†178
- Barley break**, game, 14-173
- Barlowe, Arthur**, 13-479
- Barn owls**, 4-†164, 165, 166, 175
- Barn swallows**, 4-33, 34, color plate, †88
- Barnabas, Saint**, preaches in Antioch, 5-3, 5, 6
- "Barnaby Rudge,"** by Dickens, 13-245
- Barnacles**, crustaceans, 3-†189-91  
prehistoric, 3-9
- Barnard, George Grey**, sculptures by, 11-†374
- Barnett, Eva Ware, Mrs.**, song by, 8-30-B

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Barnum, Phineas Taylor**, father of the circus,  
main article, 12-†575-79  
portrait, 12-\*575
- Barneyard animals**, drawing and mounting, 14-\*69
- Barograph**, self-registering barometer, 1-276,  
\*455
- Barometer**, main article, 1-†258-61, \*455, 456  
aneroid, 1-261  
how to make, 14-†48  
invented by Torricelli, 13-108  
mercury, 1-260
- Barometric pressure**, 1-260
- Barons**  
England  
Magna Charta granted to, 6-\*18, 24, 170;  
7-\*352, 353  
ownership of England, 6-83  
power limited by Parliament, 6-37  
France, 6-169, 170, \*171
- Baroque style**  
architecture, 11-491  
art and artists, 11-†180-88  
brought to Flanders, 11-218  
El Greco's mastery of, 11-243  
ironwork, 12-\*9  
Rembrandt, 11-273
- "Barrack Room Ballads,"** by Kipling, 13-269
- Barrage**, barrier of artillery fire, 10-362
- Barre, Vt.**, quarrying, 8-403
- Barred owl**, 4-167
- Barrel**, liquid measure, 10-375
- Barrel vaults**, architecture, 11-455, \*463
- Barrel vision**, 2-434
- "Barren Ground,"** novel by Ellen Glasgow, 13-  
352
- Barrere, Georges**, flutist, 12-258-A
- Barrett, Elizabeth** (Mrs. Robert Browning),  
13-251, 253
- Barie, Sir James Matthew**, life and works,  
main article, 13-267-68  
- portrait, 13-\*268
- Barry**, dog hero, 4-503
- Bartering**, economics, 7-502
- Barth, Heinrich**, Sahara explored by, 5-454
- Bartholdi, Frederic August**, Statue of Liberty  
designed by, 7-402
- "Bartholomew Fair,"** by Ben Jonson, 13-164
- Bartlett, Paul F.**, statue by, 11-\*376
- Bartolommeo di San Marco, Fra** (Baccio della  
Porta), paintings, 11-165  
portrait of Savonarola, 13-\*539
- Barton, Clara**, work for American Red Cross,  
7-428
- Barton, Otis**, diving bell invented by, 10-\*525
- Baruch, Bernard M.**, heads War Industries  
Board, 7-324
- Barye, Antoine**, sculptures, 11-329, 335  
lion, 11-\*332
- Bas, Elizabeth**, portrait by Rembrandt, 11-\*276
- Basalt**, rock, in Idaho, 1-76
- Bascule bridges**, 10-214
- Base of column**, architecture, 11-\*418
- Base-running**, in baseball, 14-507
- Baseball**, main article, 14-†503-8  
diagram of diamond, 14-\*506  
flight of ball, 1-287, \*288  
imaginary game on moon Phobos, 1-151  
law of inertia applied to, 1-†309  
leagues, 14-508  
principle of bat hitting ball, 1-\*326
- Baseball bats**, manufacture of, 8-138
- Basel**, Switzerland, 10-256; 6-\*254-A  
defense of, 6-249  
map, 6-584
- Basel, Peace of**, 1499, 6-250
- Basemen**, in baseball, 14-504, 506
- Basic English**, universal language, 10-7
- Basilicas**, buildings, 11-†441-43  
Forum, Rome, 5-\*221, 228, 231
- Basilisk**, lizard, 3-453
- Basin Ranges**, U. S., 8-42
- Basin Range Province**, United States, 7-343-D  
Arizona, 8-24
- Basket fish**, 3-134
- Basket makers**, primitive peoples, 8-391
- Basketball**, main article, 14-†484-86
- Basketry**, main article, 12-†128-35  
American Indian, 12-130 to 134, 7-†93, †94, 96,  
\*106  
boats and sails, 12-†130, 134  
coiled, 12-\*128, 134  
decoration and ornament, 12-\*128, †132  
Egyptian, 12-†130, \*131, 134  
hanging, how to make, 14-†50  
Jamaican, 7-\*53  
machine-made, 12-†134  
water tight, 12-131  
wattle-work huts, 12-†129, 130  
weaving, 12-†134, 135
- Basques**, people, 6-317
- Basra**, Iraq, 5-400  
date center, 10-237  
map, 5-582, 134
- Bass**, fish, 3-238, \*239; 9-368
- Bass clarinet**, musical instrument, 12-258-B
- Bass drum**, 12-258-C
- Bass viol**, musical instrument, 12-258, 226  
ancestor, 12-222
- Bassae**, Greece, temple of Apollo, 5-\*17, 18
- Basse Terre**, island, West Indies, 7-64
- Basse Terre**, village, Martinique, 7-\*65
- Basset horn**, musical instrument, 12-258-B
- Basset hounds**, 4-\*493
- Bassi, Laura**, 13-370
- Bassoon**, musical instrument, 12-258-A
- Basswood**, uses, 9-258
- Bastien-Lepage, Jules**, painting of Joan of Arc,  
6-\*172
- Bastille**, prison, Paris, 6-\*187, 191  
key at Mount Vernon, Va., 12-452
- Bastille Day**, 6-187
- Basutoland**, South Africa, becomes British,  
5-484  
map, 5-577

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



- Basutos**, African Negroes, 5-478  
**"Bataan,"** Australian battleship, 5-\*560-C  
**Bataan Peninsula**, P. I., defense, 6-531; 12-555-J  
**Batan Islands**, Pacific Ocean, map, 5-594  
**Batatas**, Indian name for sweet-potato, 2-174  
**Batavia** (Jakarta), seaport of Java and capital of Indonesia, 5-\*529-A  
     Captain Cook's visit, 13-489  
     rainfall and temperature, 5-529-B  
**Bates College**, Lewiston, Maine, 8-149  
**Bath**, England, resort, 11-300  
     mineral springs, 1-90, 91  
     Roman baths, 6-\*3; 11-62  
**Bath**, Maine, shipbuilding, 8-153  
**Bath**, N. C., 8-289  
**"Bather, The,"** statue by Richard E. Brooks, 11-\*376  
**"Bather, The,"** statue by Stewardson, 11-\*373  
**Bathory, Stephen**, king of Poland, reign, 6-450  
**Bathrooms** in ancient Crete, 5-146; 11-32  
**Baths**, on modern steamer, 10-\*296, 297, 302, \*303  
**Baths**, Roman, 5-\*239, 248; 11-62, 438  
**Baths of Caracalla**, 12-111  
**Bathtubs**, enamel, 12-63  
**Bathurst**, capital of Gambia, Africa, 5-471  
**Bathurst**, New South Wales, 5-550  
**Bathurst Island**, (Canada, magnetic area, 10-\*456  
**Batik cloth**, 5-523  
**Batiked glass**, how to make, 14-†55  
**Baton Rouge**, La., 8-140, 145  
     State Capitol, 8-\*140  
     university at, 8-142  
**Bats**, animals, main article, 4-†271-76  
     pollen carried by, 2-112  
     symbolic of happiness, 12-150  
**Batta village**, Sumatra, weaving, 5-\*430  
**Battalion**, in U. S. Army, 7-479 F  
**Battering-rams**, 10-356, \*357  
**Battery**, of orchestra, 12-258-C  
**Battery**, storage, construction, 1-\*498  
**Batting**, in baseball, 14-506  
**Battle at sea**, 6-\*532  
**Battle-axe**, ancient Egyptian, 11-\*8  
**Battle Creek**, Mich., 8-183  
**Battle fleet**, U. S. Navy, 7-436  
**"Battle Hymn of the Republic,"** by Julia Ward Howe, 13-316  
**"Battle of Blenheim, The,"** by Southey, 13-220  
**"Battle of Bunker Hill, The,"** painting by Trumbull, 7-\*164  
**"Battle of Friedland,"** painting by Meissonier, 11-\*339, 340  
**"Battle of the Books, The,"** by Swift, 13-178  
**Battle of the Nations**, see Leipzig, Battle of  
**Battleborn State** (Nevada), 8-234-B  
**Battledore and shuttlecock**, game, 14-153  
**Battlements** (crenellations), 11-\*460  
**Battles**, with kites, 14-499, 502  
**Battleships**, description, 7-485, \*294; 10-\*348  
     international rivalry in construction of, 7-484  
     "Missouri," 10-\*348  
**Battleships—continued**  
     of Civil War period, 7-\*259, \*262  
     Spanish-American War type, 7-\*297  
     "Texas," 10-\*380  
     see also United States Navy  
**Batts, Thomas**, explorer, 8-431  
**Batu Khan**, Mogul ruler, 6-426  
**Batum**, port on Black Sea, 10-262  
     Revolutionary center, 12-449-E  
     map, 5-582, D2  
**Baucis and Philemon**, mythology, 14-451  
**Bauxite**, Ark., smelting plant, 8-\*29; 9-422  
**Bauxite**, mineral, 8-29  
     United States, 7-343-F  
**Bavaria**, state, Germany  
     Babenbergs and, 6-258  
     beer, 10-257  
     costume, 9-\*23  
     map, 6-582  
     Oberammergau Passion Play, 12-327, †328  
     struggle for crown of, 6-223  
**Bavarian Alps**, 6-241-B  
**Baxter, Elisha**, American political figure, 8-29  
**Baxter, Percival**, land given to Maine, 8-156-A  
**Baxter State Park**, Maine, 8-156-A  
**Bay**, see names of bays, as Biscay, Bay of  
**Bay, Laguna de**, lake, Philippine Islands, 5-570  
**"Bay Psalm Book, The,"** first book published in America, 10-56  
**Bay State** (Massachusetts), 8-176-B  
**Bayberry candles**, 10-389  
**Bayeux tapestry**, Halley's comet in, 1-\*162  
**Bayley**, of castle, 11-457  
**Bayou**, in physiography, 8-140  
     Louisiana, 8-146  
     Mississippi, 8-206, 206-A  
**Bayou State**, nickname for Mississippi, 8-206-A  
**Bayreuth**, Germany, Festival Playhouse, 12-251, -'6  
**Bazaars**, Arabian, 5-417  
**Bazooka**, 10-368-F  
**Bazaire, François Achille**, invades Mexico City, 7-\*84  
**B.C.**, meaning of, 10-476  
**Beaches**, found on mountain tops, 1-21  
**Beacon fires**, 10-28  
**Beacon signals**, radio, 10-121; 10-328-B  
**Beaconsfield, Earl of**, see Disraeli, Benjamin  
**Bead and reel**, ornament, 11-\*425  
**Beaded lizard**, 3-458  
**Beadles**, nickname for people of Virginia, 8-418-A  
**Beads**  
     coral, 3-102  
     Czechoslovakian, 6-357  
     Egyptian, 12-\*119  
     glass, 12-27, 32, 36  
     Indians' fondness for, 12-\*118  
**"Beagle,"** ship, Darwin's expedition in, 13-435  
**Beak**, of bird, 4-\*11, 13, \*193, †194  
     crossbill, 4-\*129, 130  
     flamingo, 4-†198

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Beak, of bird—continued**

- godwit, 4-118
- parrot tribe, 4-190
- puffin, 4-\*205, 208
- shoveler, 4-119
- skimmer, 4-204
- wood hewer, 4-\*68
- woodcock, 4-113
- woodpecker, 4-67

**Beakhead, ornament, 11-\*474****Beam, radio, 10-328-B-28-1D****Beam scale, 10-372****Bean, William, American pioneer, 8-368****Bean, plant**

- early stages of growth, 2-\*218
- giant, 2-\*253
- soil benefited by, 10-546

**Bean anthracnose, disease, 2-\*139****Bean bags, game, 14-158****Bean gun, how to make, 14-†35****Bean toss, game, 14-170****Beans, baked**

- canning, 9-\*228
- used by campers, 14-\*553, 554

**Bear, animal, see Bears****Bear, Little, constellation, see Little Bear****Bear, Great, constellation, see Great Bear****Bear-baiting, 6-425****Bear Constellation (Arctos), 13-503****Bear flag, 8-42-B****Bear Flag War, 8-37****Bear Mountain, Conn., height, 8-62****Bear River, U. S., 8-396**

- Idaho, 8-92-A
- Wyoming, 8-454

**Bear River Migratory Bird Refuge, 8-396-A****Bear River Mountains, Idaho, 8-92-A****Bear State, state nickname for:**

- Arkansas, 8-30-B
- Kentucky, 8-138-B

**"Bear Tamer, The," statue by Paul F. Bartlett, 11-\*376****Beard, Charles A., quoted on government, 7-401****Beard, Thomas, 9-59****Bearded lizard, 3-\*449****Beards**

- ibex, 4-\*429
- mussel, 3-156
- ordered cut by Czar Peter, 6-430
- wild goats and sheep, 4-426

**Bearings, mechanics**

- ball, principle of, 1-†319
- cause of burnt-out, 1-320

**Bears, animals, main article, 4-†311-25**

- Alaskan preserve, 8-16-A
- black, 4-\*314-15, \*317, †318-19
- brown, 4-\*312, 316, \*477
- drawing and mounting, 14-\*68
- emblem on flag, 8-42-B
- grizzly, 4-†313-15, \*318
- numerous in early Russia, 6-425

**Bears—continued**

- Pleistocene period, 3-\*56
- polar, 4-\*319, †320-22, †478
- raccoon family, 4-†322-25
- zoo, 4-\*477, 478, \*479

**Bears, sea (seals), 4-†327-31****Bears, stock brokers, 7-581****Bear's-paw clam, 3-\*153****Beartooth Range, Montana, 8-216****Beasley, Mercer, tennis player, 14-470****"Beata Beatrix," painting by Dante Gabriel Rossetti, 13-257****Beatrice Portinari, friend of Dante, 6-\*299; 13-†59****Beauchamp, Richard, earl of Warwick, 13-145****"Beauchamp's Career," by George Meredith, 13-263****Beaufort Sea, Arctic Ocean, maps, 13-502-A; 7-592****Beaulieu, Margaret, music to Minnesota song, 8-198-A****Baumarchais, Pierre Caron de, life and works, main article, 13-121**

- aids American colonists, 13-121; 12-451
- portrait, 13-\*121

**"Beaumont Family, The," painting by Romney, 11-\*300****Beauregard, Pierre Gustave Touant, portrait, 7-\*257****"Beautiful and Damned, The," novel by F. Scott Fitzgerald, 13-351****Beautiful God of Amiens, statue, 11-†98****"Beautiful Ohio," song, 8-312-B****"Beauty and the Beast," fairy tale, text, 14-†238-40****Beauvais, Vincent de, see Vincent de Beauvais****Beauvais, France, tapestry center, 12-144****"Beauvoir," home of Jefferson Davis, 8-202****Beaux, Cecelia**

- "Girl in White," painting by, 11-\*363

**Beaver, animal, main article, 4-†373-76**

- lodges, 4-†373-75; 3-223
- Reservation, Alaska, 8-16-B

**Beaver Indians, transportation methods, 10-\*132****Beaver River, Penn., 8-312-A****Beaver State, nickname for:**

- Minnesota, 8-198-A
- Oregon, 8-332

**Beaverboard, 9-294****"Beavers," people of Oregon, 8-332****"Bêche-de-mer," sea cucumber, 3-139****Beck, Joseph, Polish cabinet officer, 6-241****Becket, Thomas, à, archbishop of Canterbury and Henry II, 6-20, 21**

- portrait, 6-\*20
- shrine, 14-329

**Becquerel, Henry, scientist, 1-283****"Bed of justice," origin of term, 12-185****Bed rock, 1-\*97****Bede, The Venerable, life and work, main article, 13-†140-41**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Bede** —*continued*

"Ecclesiastical History of England," reproduction of page from, 13-†141  
quoted, 6-9

**Bedford, Duke of**, refund to railways, 10-188

**Bedford, Gunning, Jr.**, 12-496

**Bedford, John Plantagenet, Duke of**, 6-36

**Bedivere, Sir**, in Arthurian romances, 14-403

"**Bedlam**," origin and meaning of term, 10-21

**Bedlington terriers**, 4-†497

**Bedloe Island**, island in upper New York bay, property of Federal government, 8-284-A

**Bedouins**, in Egypt, 5-73-B

bride and groom, 5-†140

**Bedroom**, Pullman train, 10-193

**Beds**, furniture

campers', 14-†558

earliest, 12-176 fol.

Louis XVI style, 12-†189

modernistic, 12-†174

**Bee**, *see* Bees

**Bee balm**, flower, 2-†170,

**Bee eater**, bird, color plate, 4-†185

**Bee fly**, 3-365

**Bee hawk moth**, 3-†291, 292

**Bee hives**, 3 \*309, †311 fol.

baked clay, 5-†94

symbol of Utah, 8-396-A

**Bee martin** (kingbird), 4-†44

**Beebe, William**

colors of fishes studied by, 3-194

diving ball, 1-367; 10-†525, 526

**Beech**, tree, 2-160, \*271

**Beech family**, trees, 2-150

**Beecher, Catherine**, 13-318

**Beecher, Henry Ward**, 13-318

**Beecher, Lyman**, 13-318

**Beechnut**, 2-160; 9-204

**Beef**, weight: cuts, 9-†328; *see also* Cattle.  
Meat: Meat industry

**Beef extract**, Liebig's, 13-388

**Beef State**, 8-386-A

**Beefeaters**, wardens of the Tower of London, 6-†86

**Beehive State** (Utah), 8-396-A

**Bees**, insects, main articles, 3-†297-304, †300-18  
anatomy, 3-†299

brood comb, 3-†314, 315

cement made by, 3-302, †303

hives, 3-†309, 311 fol.

baked-clay bee houses, 5-†94

honey, 3-313, 314

life cycle, 3-298, 300

nests, 3-298, †300 fol.

pollen baskets, 3-313

pollination by, 3-†271, 272, \*274, 313, 318;  
2-†107 fol., 166

social, 3-†297-300, †309-18

solitary, 3-†300-4

sting, 3-314; 10-†489

swarming of, 3-†311, \*315, 316

symbol of power, 6-350

**Bees**—*continued*

wax made by, 3-313, 314, 315

welfare of hive of first importance, 3-318

**Beeswax**, for candles, 10-389

**Beet**, vegetable, 9-150

effect of light and temperature on, 2-224

process of obtaining food, 2-†40

result of experiment, 2-222

**Beet, sugar**, 9-†126-27

Colorado, 8-†51

**Beethoven, Ludwig van**, life, main article, 12-†277-80

music of, 12-239-42

musical instruments used by

bass viol, 12-258

bassoon, 12-258-A

double bassoon, 12-258-A

brasses, 12-258-B

clarinet, 12-258-B

flute, 12-258-A

horns, 12-258-B

oboe, 12-258-A

percussion instruments, 12-258-C

triangle, 12-258-C

violoncello, 12-258

portraits, 12-†240, \*241, \*278

Salieri his teacher, 12-298

**Beetles**, insects, main article, 3-†329-43

armor, 3-273, 329

classification, 3-†69

color plate, 3-†342

eggs and hatching, 3-†331 fol., \*341

giant species, 3-†339-42

Japanese, 3-336, \*329

scarab, 3-†272, \*274, \*329, †331-32

soil formation helped by, 1-97

water beetles, 3-†396-401

wings and wing cases, 3-329, †330

**Beggar**, origin of term, 10-25

"**Beggar on Horseback**," drama by Marc Connelly, 13-355

"**Beggar's Opera**," by Gay, 13-184

**Beggar's tick**, plant, 2-223

**Beggars**, 7-434, 435

English, during Elizabeth's reign, 6-54

**Beghards**, religious laymen, 10-25

**Behistun Rock**, inscription, 5-104

"**Behold a rose of beauty from Jesse's rod is sprung**," music by Palestrina, 12-220

**Behring, Emil**, study of blood, 2-344, 349

**Bel San Giovanni**, church, Florence, *see* Baptistery

**Beilis, Mendel**, 5-136

**Beirut**, capital of Lebanon, 5-401

**Beisa oryx**, antelope, 4-†419, \*421

**Béla IV**, king of Hungary, reign, 6-280

**Belfast**, Ireland, linen center, 9-48; 6-†162-A

**Belfries**, architecture, 11-†454, \*455

**Belfry**, change in spelling of word, 10-22

**Belgae**, people, metal work, 12-6

**Belgian Congo**, colony, Africa, 5-468

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Belgian Congo**—*continued*  
 map, 5-575  
 minerals, 5-473-B; 9-426  
**Belgian literature**, work of Maeterlinck, 13-99  
**Belgium**, country, Europe, description and history, 6-†345-51; general data, 6-355-B  
 area, 6-355-B  
 art, *see* Flemish art  
 canals, 6-348  
 climate, 6-355-B  
 dog carts, 6-\*346, 348; 4-500  
 flag, color plate, 14—following 570, no. 6  
 government, 6-355-B  
 independence established, 6-198  
 \*laces, 12-\*165, \*168, 170  
 language, 6-346, 355-B  
 literature: Maeterlinck, 13-99-100  
 location, 6-355-B  
 maps, 6-592  
   on map of Europe, 6-570  
 mountains, 6-351  
 New World missionary, 8-217  
 New Year's customs, 14-578  
 people, 6-355-B  
 physical features, 6-355-B  
 plundered by the Spanish, 11-218  
 possessions, African, 5-473-B  
   Congo Free State annexed by, 5-468  
   map showing, 5-\*444  
 products and industries, 6-351  
   cheese, 9-348  
   coal, 6-351; 9-438  
   lace making, 6-350  
   linen manufacture, 9-48  
   poultry, 9-358  
   rug manufacture, 12-159  
 provinces, list, 6-355-B  
 Reformation, 6-\*347, \*350  
 refugees, World War I, 6-\*506  
 trade, 6-345  
 \*merchant marine, number, 10-232  
 waterways, 6-355-B  
 World War I, 6-236, †348  
*see also under* Flanders; Flemish; Netherlands;  
 index World War II, 6-493  
**Belgrade**, Yugoslavia, description, 6-366; 10-259  
 Austrian attack on, 6-363  
 location by Lat. and Long., 6-290-A  
 rainfall and temperature, 6-290-A  
**Belisarius**, Roman general, 5-†407  
**Bell, Acton**, pen name of Anne Brontë, 13-248  
**Bell, Alexander Graham**, life, 10-†108-13  
   and Helen Keller, 12-567  
   invents telephone, 1-517, 520; 10-†108-13  
   portraits, 10-\*102, \*111  
**Bell, Currer**, pen name of Charlotte Brontë, 13-248  
**Bell, Ellis**, pen name of Emily Brontë, 13-248  
**Bell, Henry**, steamboat of, 10-\*219, 220  
**Bell, John**, presidential nominee, 7-250  
**Bell, Mabel Hubbard** (Mrs. Alexander Graham Bell), 10-111  
**Bell, Patrick**, reaper made by, 10-412  
**Bell, electric**  
   examples of parallel connection, 1-517  
   principle of operation, 1-†490, 491  
**Bell**, section of musical instrument, 12-258-B  
**Bell birds**, 4-179  
**Bell buoys**, 10-\*227  
**Bell Harry Tower**, Canterbury Cathedral, 11-\*473  
**Bell Telephone Company**, formation and work, 10-†108, †112-13  
**Bell towers**, architecture, 11-†454, \*455  
**"Bella, La,"** painting by Titian, 11-\*180  
**Bellacoola Indian mask**, 12-\*98  
**Belladonna**, plant, 9-145, 219  
**Belle Fourche Bird Refuge**, 8-364-A  
**"Belle Nivernaise, La,"** by Daudet, 13-133  
**Belleau Wood, Battle of**, 7-326  
**Bellerophon**, demigod, mythology, 14-†444-45; 10-\*314  
   death, 14-432  
**"Bellerophon,"** ship boarded by Napoleon after Waterloo, 12-\*432  
**Belles of fairyland and**, game, 14-169  
**Belleville**, Kansas, no taxes, 8-132  
**Bellicent, Queen**, in Arthurian romances, 14-387  
**Bellingshausen, Fabian Gottlieb von**, discoveries in the Antarctic, 13-506  
**Bellini, Gentile**, paintings, 11-172  
   miraculous finding of true cross, 11-\*173  
   portrait of the Sultan, 11-\*173  
**Bellini, Giovanni**, art, 11-172, †174-76  
   and Durer, 11-211  
   paintings  
     "Madonna and Child and Saints," 11-\*175  
     Madonna with four saints, 11-\*176  
     portrait of doge, 11-\*175  
     Virgin and Child, 12-\*213  
**Bellini, Jacopo**  
   family, 11-140, 172  
   Madonna and Child, painting, 11-\*173  
**Bellini, Vincenzo**, Italian composer, 12-253  
**Bellis** (daisy), 2-\*182  
**"Bells, The,"** poem by Edgar Allan Poe, 13-315  
**Bellver, castle of**, Majorca, 6-\*471  
**Belly River**, Montana and Canada, 8-220  
**Belmont county**, Ohio, coal mining, 8-311  
**Beloit**, Kansas, no taxes, 8-132  
**Beloit**, Wisconsin, manufacturing, 8-444  
**Belshazzar**, king of Babylonia, 5-\*128  
**Belted kingfisher**, 4-†48-49  
**Beluga**, whale, 4-446  
**Bemberg**, rayon, 9-83  
**"Ben Hur,"** photoplay, 10-507  
**Ben Nevis**, highest mountain in Scotland, 6-108-B  
**Bench**  
   Egyptian, 12-177  
   how to make, 14-†50  
**Bendigo**, Australia, gold discovered, 5-557  
**Bends** (caisson disease), 1-462; 10-522, 524  
**Benedict, Saint**, 5-278  
**Benedictines**, religious order, 5-278

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Benét, Stephen Vincent**, poet, 13-354
- Benevolence**, loan, to Henry VII, 6-43
- Bengal**, province, India  
British warfare in, 5-381  
productivity, 5-385
- Bengal, Bay of**, Indian Ocean, maps, 5-587  
on map of Asia, 5-581  
on map of World, 5-573
- Benghazi**, Cyrenaica, Africa, 5-455
- Ben-i-rail**, name for Afghans, 5-434
- Bennett, Floyd**  
Arctic flight, 13-502  
portrait, 10-\*324
- Bennett, Richard Bedford**, Canadian premier, 7-29, 29-B
- Bennington, Vt.**, monument, 8-\*399
- Bennington, Battle of**, 12-489; 8-399  
anniversary celebrated as holiday, 8-404
- Bentham, Jeremy**, utilitarianism, 13-239
- Benthoscope**, diving bell, 10-526
- Bentinck, William Cavendish, Lord**, suttee abolished by, 5-383
- Benton, Thomas Hart**, artist, painting by, 11-\*392-A
- Benton, Thomas Hart**, senator, 8-212 B
- Benton Lake Migratory Bird Refuge**, 8-220 A
- "Benvenuto Cellini,"** opera by Berlioz, 12-306
- Benz, Karl**, gasoline car made by, 10-278, \*280
- Benzene**, 1-\*392, 9-456; 10-552
- Beowulf**, Anglo-Saxon epic, 14-4318-22
- Berberin**, Egyptian farmers, 5-73-B
- Berberis aquifolium*, 8-332
- Berbers**, people, 5-39  
Africa, 5-445, 451, 453, 473-C  
race, 5-39, 445  
Spain and Portugal, 5-270, 6-320, 337
- Berea grit**, 8-312
- Berg, Alban**, 12-252
- Bergdamaras** (Klip kaffers), inhabitants of Southwest Africa, 5-491-B
- Beriberi**, disease, caused by vitamin deficiency, 2-262, 365
- Bering, Vitus**, Alaska discovered by, 8-11
- Bering Sea**, between Asia and No. Amer.  
maps, 8-560; 5-572  
seal-fishing arbitration, 7-28, 289
- Bering Sea Bird Refuge**, 8-16-B
- Bering Strait**, between Alaska and Asia, maps, 8-560; 5-572
- Bering's River**, Alaska, *see* Alsek River
- Berkeley, John, Baron of Stratton**, grantee of New Jersey, 8-252-A, 250
- Berkeley, Sir William**, governor of Virginia, 8-410
- Berkeley, Calif.**, university at, 8-\*34
- Berkelium**, element, symbol, atomic no. and weight, 1-\*551
- Berkshire Hills**, in Massachusetts, 8-176-A
- Berlichingen, Goetz von** (Goetz of the Iron Hand), leads Peasants' War, 6-213
- Berlin, Germany**, 6-229; 10-258
- Berlin--continued**  
Brandenburg Gate, 6-\*236  
cathedral, 6-\*229  
improved by the Great Elector, 6-218  
location, 6-241-B  
map, 6-582, F2  
Reichstag Building, 6-\*236  
theater; Freie Buhne founded, 12-333
- Berlin, N. H.**, 8-241
- Berlin, Congress of**, 6-\*232
- Berlin Decree**, 7-208
- Berliner, Emile**, perfects talking machine, 10-498
- Berlioz, Hector**, life and works, main article, 12-†304-6  
guitar played by, 12-258-D  
"Harold in Italy" by, 12-258  
music of, 12-246  
portrait, 12-\*306  
saxophone praised by, 12-258-E
- Berlioz, Henrietta Smithson** (Mme. Hector Berlioz), 12-306
- Bermuda**, islands, Atlantic Ocean, 6-\*489, 490;  
general data, 7-66-B  
coral formation, 3-99  
map, 7-591  
sea creatures in waters of, 3-80  
weather station, 1-261
- "Bermuda high,"** meteorology, 1-261
- Bernabo**, Italian tyrant, 6-300
- Bernadotte**, *see* Charles XIV, John, king of Sweden and Norway.
- Bernadotte, Count Folke**, 6-563
- Bernard, Claude**, scientist, 2-378
- Bernard, Saint, of Clairvaux**, life, main article, 13-†534-35
- Bernardin kangaroo**, 4-\*462
- Bernardines**, religious order, 13-535
- Bernardone, Giovanni**, *see* Francis, Saint, of Assisi
- Berne**, Switzerland  
joins Swiss Confederation, 6-248  
Zahniger Fountain and Clock Tower, 6-\*252
- Bernese Oberland**, dist., Switzerland, dairying, 6-240
- Bernhardt, Sarah** (Rosine Bernard), French actress, 12-333  
in moving pictures, 10-507
- Bernini, Giovanni**, art, 11-188  
sculptures  
Aeneas carrying away his father, 11-\*183  
Daphne and Apollo, 14-\*439  
David, 11-\*183  
Proserpina carried off by Pluto, 14-\*417  
Vision of St. Theresa, 11-\*187
- Bernstorff, Andreas Peter von**, count, 6-416
- Bernstorff, Johann Hartwig Ernst von**, count, 6-415
- Beroë**, jellyfish, 3-113
- Berossus**, Babylonian priest, time-telling device invented by, 10-460
- Berquen, Ludwig van**, diamond cutting, 12-126

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Berries**, main article, 9-†156-59  
 fruits wrongly named berries, 2-120  
 seeds scattered by birds, 2-212, 213  
 strawberries, Florida's crops, 9-†226  
 true berry, 2-120, †121  
**Berry, John**, patron of art, *see* John, Duke of Berry  
**Berthollet, Claude Louis**, count, 13-†380  
**Bertrand du Guesclin**, *see* Du Guesclin, Bertrand  
**Beryl**, mineral, semi-precious stones from, 9-433  
**Beryllium**, element, 1-547, \*551; 9-433  
   alloyed with copper, 9-419  
**Bes, god**, in Egyptian enamel, 12-†64  
**Bessarabia**, division of Roumania, 6-368-A  
   becomes part of Roumania, 6-360  
   timber, 6-368-B  
**Bessel, Friedrich Wilhelm**, finds distance to star, 1-173  
**Bessemer, Sir Henry**, steel-manufacturing process invented, 9-403  
**Bessemer process** of steel manufacture, 9-†403, 405  
   adopted by Carnegie, 12-566  
**"Best Friend,"** locomotive, 10-183  
**"Best of all possible worlds,"** philosophy of Leibnitz, 13-15  
**Beta rays** of radium, 9-426  
**Betel palm**, 9-191  
**Betelgeuse**, star, 1-170, 173, \*178  
   star maps showing  
     March and April, 1-178-D  
     Nov. and Dec., 1-178-L  
**Bethany, Miss.**, battlefield site, 8-206  
**Bethlehem**, Palestine, scene at old well, 5-†140  
**Bethlehem, Penn.**, old waterworks, 10-†541  
**Bethlen, Stefan**, services to Hungary, 6-290  
**Betrothal or marriage rings**, 12-†87, 177  
**Betz, Pauline**, tennis player, 14-470  
**Bevan and Cross**, viscose process, 9-83  
**Beverages**, recipes for, 14-88  
**Bévin, Ernest**, biography, 6-565  
**Bewick's swan**, 4-†118  
**Bey**, native ruler of Tunisia, 5-473-C  
**"Beyond Our Powers,"** by Björnson, 13-99  
**Bhutan**, country, Asia, 5-336-D  
**Bible**  
   a monument to Semitic genius, 5-97  
   chained Bibles, 10-†47  
   drama based on, 12-326  
   Erasmus' edition and translation, 13-83  
   "Great Bibles": first authorized English Bible, 10-†54  
   Gutenberg Bible, 10-†48, 50  
   King James (Authorized) Version, 6-60  
   Luther's translation of New Testament, 13-544  
   origin of name, 5-112  
   revered by Mohammedans, 5-422  
   source of Hebrew history, 5-118  
   Tyndale's translation, 10-13  
   Welsh edition, 6-140  
   Wycliffe's translation, 6-32

**Bibliothèque Nationale**, national library of France, Paris, 10-560  
**Bicarbonate of soda**, in blood, 2-339  
**Biceps**, muscle, 2-327, \*328, 329; 1-328  
**Bicuspid valve**, 2-†375  
**Bicuspid**, teeth, 2-†314  
**Bicycle**  
   development of, 10-†142  
   mechanical principle, 1-331  
   safety precautions, 2-447  
**Bicycle exercise**, 2-†417  
**Biddeford, Maine**, founding of, 8-152  
   mills, 8-154  
**Biddle, Major and Mrs. John**, portraits by Gilbert Stuart, 11-†370  
**Biela's Comet**, 1-167  
**Bienville, Jean Baptiste Lemoyne Sieur de**, 8-141  
**Bierce, Ambrose**, author, 13-346  
**Big Ben of Westminster**, clock, 10-†465, 468  
**Big Bend National Park**, Texas, part of international peace park, 8-386-A  
**Big Bend State**, nickname for Tennessee, 8-374  
**Big Benders**, nickname for natives of Tennessee, 8-374  
**Big Black Mountain**, Kentucky, height, 8-138-A  
**Big Black River**, U. S., in western Mississippi, length, 8-206  
**Big Blue River**, U. S.  
   Kansas, 8-131  
   Nebraska, 8-228  
**Big Business**  
   after World War I, 7-333, 338  
   Anti-Trust Act, 7-289, 308  
   control under dictatorships, 7-554  
   development after Civil War, 7-277, 282  
   during Cleveland's administration, 7-288  
   farming becomes, 7-457  
   leaders, 7-282  
   opposed by farmer and free-silver parties, 7-291-92  
   opposition under Theodore Roosevelt's administration, 7-308; 12-544  
   Wilson's opposition to, 7-315; 12-549, 552  
   *see also* Business  
**Big Cypress Swamp**, Florida, 8-76  
**Big Dipper**, part of Great Bear constellation, 1-178  
   *for star maps see* Great Bear  
**Big Ditch**, name for Panama Canal, 7-48  
**Big dog**, constellation, star maps showing:  
   Jan. and Feb., 1-178-B  
   March and April, 1-178-D  
**Big game hunting**, Africa, 5-458, \*460  
**Big Hole Battlefield National Monument**, 8-220-A  
**Big Horn Mountains**, U. S., 8-454  
**Big Horn River**, U. S., 8-454  
**Big Lake**, lake lying in Missouri and Arkansas, 8-30-A  
**Big Lake Bird Refuge**, 8-30-A  
**Big Lost River**, Idaho, 8-92-A

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- "Big Muddy,"** nickname for Missouri River, 7-215
- Big Muddy River,** Montana, 8-220
- Big Salt plain,** Oklahoma, 8-320-A
- Big Sandy River,** between West Virginia and Kentucky, 8-138-A
- West Virginia,** 8-436-A
- Big Sioux River,** U. S.  
Iowa, 8-124  
power furnished by, 8-362  
South Dakota, 8-364
- Big Stone Lake,** U. S., 8-364
- Big trees,** *see* Redwoods; Sequoias; Trees
- Big Turtle,** Indian name for Daniel Boone, 12-472
- Bighorn sheep,** 4-†426
- Biglow, Hosea,** fictional character, 13-313
- "Biglow Papers, The,"** by James Russell Lowell, 13-313; 7-239
- Bijou snake,** 3-\*499
- Bikini Island,** atomic bomb tests, 1-\*558-E, 558-II
- Bile,** secretion, nature and function, 2-357
- Bilirubin,** pigment of bile, 2-345, 357, 358
- Biliverdin,** pigment of bile, 2-345, 357, 358
- Bill,** of birds, *see* Beak
- Bill of Rights,** U. S. Constitution, 7-199, 368  
free speech guaranteed by, 7-334
- Bill Williams Fork,** river, *see* Williams River
- Billet,** ornament, 11-\*474
- Billiard tables,** 14-478
- Billiards,** game, main article, 14-†477-82  
balls made of plastics, 10-552
- Billings, Montana,** 8-219
- Billingsgate,** abusive speech, 9-\*370
- Billingsgate Market,** London, 9-\*370
- Billiton Is.,** East Indies, 5-529-B; map, 5-596
- Biloxi, Miss.,** 8-201, 205
- Bimini,** islands of Bahamas, 7-53
- Binary form,** music, 12-224
- Binary or double stars,** 1-174; 13-404
- Bingen, Germany,** Mouse Tower, 6-\*207
- Bingham, Lieutenant,** table, 1-25
- Bingham, Mrs. William,** 7-193
- Bingham, Utah,** copper mine, 8-\*393
- Binghamton, New York,** 9-59
- Binocular glass,** parts of, 1-\*434
- Binturong,** animal, 4-\*324
- "Biographia Literaria,"** by Samuel Taylor Coleridge, 13-218
- Biographies** (*see* Contents Volumes 12 and 13)  
composers, Volume 12  
explorers, Volume 13  
historical characters, Volume 12  
literary, Volume 13  
miscellaneous, Volume 12  
most excellent ever written, 13-195, 197  
philosophers, Volume 13  
religious leaders, Volume 13  
scientists, Volume 13  
*see also* names of famous men and women in index
- Biological chemistry,** 10-545
- Biological Survey, Bureau of,** 4-516
- Biology,** science of life  
beginnings of life, 3-6  
cells  
plants and animals composed of, 2-279  
structure and division, 2-†6-10, †279  
*see also* Cells  
definition of, 2-4  
distinction between animate and inanimate, 2-278-80  
life begets life, 2-278  
protoplasm, the living substance, 2-7, 279, 287  
divisions  
botany, (*see* Contents Volume 2 for chapter headings)  
classification of plants, 2-182-85  
definition and branches, 2-1-4  
*see also* Botany; Plants  
zoology (*see* Contents Volumes 3 and 4 for chapter headings)  
classification of animal kingdom, 3-†66-70  
by Agassiz, 13-432  
by Cuvier, 13-†423-24  
*see also* Animals; Zoology  
embryology  
development of egg cell in animals, 13-\*361  
egg cell of plant, 2-\*83, 84, \*89  
heredity; Mendel's laws, 13-†413-15  
importance of sunlight to life, 1-199; 2-321  
microscope aids study, 2-279  
physiology of man, *see* Physiology and Contents Volume 2  
physiology of plants, 2-4  
prehistoric life; *see* Man, prehistoric; Plants prehistoric; Prehistoric animals  
reproduction  
alteration of generations, 2-†83-85, \*89; 5-109  
asexual  
budding, 3-84, 87, 95, 98, 102  
cell division, 2-279, 280, \*9, 10  
spores, 2-76, 88  
Redi's experiments and discoveries, 2-278  
sexual, 2-†83-85, 89  
organs of fish, 3-\*233  
*see also* Reproduction
- Bion,** Greek poet, 9-79
- Biram's anemometer** for measuring air currents, 1-\*274
- Birch,** tree, 2-\*270  
sap, 2-237  
uses, 2-160; 9-258
- Birch-bark canoes,** 14-509; 10-138
- Birch family,** trees, 2-160
- Birch oil,** 2-160
- Birchlegs,** Norwegian rebel party, 6-\*379, 384
- Bird, beast, or fish,** game, 14-154
- Bird baths,** 4-124
- Bird houses,** *see* Nesting boxes
- Bird of paradise,** 4-†183; 3-\*68
- Bird Rock,** in Gulf of St. Lawrence, 4-213

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

"Birdladders" on lighthouses, 4-4

**Birds**, main article, 4-†1-239 (see Contents  
Volume 4 for chapter headings)

albino, 4-\*188, \*227

anatomy

beaks, see Beaks

breastbone and flight muscles, 4-232

eyes of owl, 4-\*10, †164

feet and claws, 4-13, 66, 151, 233, 238

legs of flightless birds, 4-232, †234

moustache, 4-78

tongue of climbing birds, 4-67, 73

tube-nose, 4-217

wings of flightless birds, 4-†218, 232, 238

Audubon societies, 13-428; 4-517

Audubon's studies, 13-427-28

paintings, 4-\*26, \*33, \*84

benefits to mankind, 4-516

blackbird, 4-†45-47, 101, 104

breaking of shells and bones, 4-161, 171

Bok carillon ("Singing Tower"), 4-517, \*3

caged, care of, 4-\*227

cat an enemy, 4-485

climbing, 4-66

color plates, 4-\*24, \*184, \*185

birds of prey, color plate, 4 \*152

familiar, gay-colored birds, color plates, 4-  
\*88, \*89

red and blue birds, color plate, 4-\*24

water birds, color plate, 4-\*120

confused by lighted buildings, 4-3

courtship and mating

American chatterer, 4-178

bird of paradise, 4-183

bower bird, 4-186

cowbird, 4-89

flycatcher, 4-137

grouse, 4-†77

lyre bird, 4-187

penguin, 4-219

prairie chicken, 4-\*95, 97

dancing, 4-178, 179, 183, 234, 238

descended from reptiles, 3-43

difference between altricial and precocial, 4-6

distinguished from other animals, 4-12

drawing and mounting, 14-\*65, \*67, \*69

dumb, 4-197

economic value, 4-9, 10

eggs

destroyed by male birds, 4-93

largest, compared with hens', 4-\*237

ostrich, 4-232, \*237

reason for whiteness and color, 4-68

stages in hatching, 4-\*96

see also Nest building and breeding, birds

extinct, 4-\*97, 205, 233, 237, 239; 5-464

fabulous

phoenix, 12-125; 5-308; 6-445

roc, of Africa, 5-446

**familiar, of countryside and woods**, 4-†15-

91, †124-30, color plates, \*88, \*89

**England**, 4-†6, †170-75

**Birds, familiar-** continued

**South and Southwest, U. S.**, 4-†132-38,  
†140-49

feathers, see Birds, plumage

"first basket makers," 12-129, \*130

**flightless and running**, 4-†232-39, 142, 143,  
163, 192, \*213

food for the bird table, 4-15, 17, 125, \*126, 128

**game birds**, 4-†93-98, †78, \*80, †143, 187, 229;  
9-318

gardens made by, 4-†186

growth stages, 4-†6

how to win confidence, 4-15

insects destroyed by, 4-10

largest, 4-162, 233

legends and stories about, 4-50, 130, 200

Leonardo da Vinci's kindness to, 11-151

means of outwitting enemies, 4-52

migration, 4-3-7, \*1, 13

behavior of different species, 4-\*1, 36, 46,  
118, 120

habit dates from prehistoric period, 3-60

males first to start, 4-7

protection against lighted towers, 4-4

most intelligent of perching birds, 4-228

moulting; color variations, 4-13, 201, 208,  
225, 229

nest building and breeding, see Nest building  
and breeding

nesting boxes, 14-†40, 41, 4-†124

kinds of birds attracted by, 4-19, †35, 36,  
61, 135

nestlings fed on insect food, 4-10

nest, edible, 4-39

night-hunting, 4-76, 164, \*177

nut cracking, 4-13, 62, 190

occupation and defense of chosen territory,  
4-7

perfect flight

albatross, 4-215

vulture, 4-161

pigment lacking, 4-†227

plumage

egrets killed for plumes, 4-140, 147

fans made from, 4-149

hairy feathers, 4-237, 238

humming birds, 4-177

kinds of feathers, uses, 4-12

plumes of ostrich, 4-235, 236

powder-down feathers, 4-13

tail coverts of peacock, 4-†188, \*191

tails, ornamental, 4-140, †146, †186-89,  
†191

tails used for props, 4-†32, \*66, 67

used on hats, 4-140

polar regions

Antarctic, 4-\*204, †218, 223, 224; 13-\*504,  
\*505

Arctic, 4-120, \*122, 128, 129, \*153, 168,  
200, \*402, 213, \*224, 229; 11-\*352, 376

prehistoric, 4-205, 210, 232

Cretaceous and Jurassic periods, 3-43

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Birds, prehistoric - continued**

Eocene period, 3-51

first appearance on earth, 3-64

flightless, 3-56

Oligocene period, 3-52

**preying**, 4-†151-68, \*97, 98, color plate, \*152

beaks and toes, 4-13

shrike similar to, 4-229

protected by Mohammedans, 5-419

protective coloration, 4-\*76, 103, 113, 117, 229, 232, 236

rank in animal kingdom, 4-12

reasons for singing, 4-7

resident, 4-125

roofs constructed by, 4-†182, †186

St. Francis preaches to birds, 11-†116, 13-530

sanctuaries, 4-517

Alaskan reservations, 8-16-B

*see also subhead reservations under names of states*

scavengers, 4-157, 159, 162, \*193

seeds scattered by, 2-131, 212, 213

sense of direction, 4-13

sentinels posted by, 4-227

slaughter of; legal protection, 4-10, 20, 80, 135, 160 fol., 161, 204, 205

smallest of North America, 4-224

social life

colonies, 4-108, 147, 157, 163, †182, \*197, \*206

movement in flocks, 4-4

songs and calls

broadcast by radio, 4-170

famous singers, 4-53, 60, 85, 87, 134, 170

graphic reproduction, 4-†5

mimics, 4-26, 55, 134, 186, 192, 226

night-singers, 4-7, 26, 60, 87, 134, 170

ventriloquism, 4-16

*see also articles on birds*, 4-16 fol., 66 fol., 154 fol.

species that catch insects on the wing, 4-42

spring habits, 4-†1-9

state birds, *see subhead state bird listed under various states*

subspecies and how they are caused, 4-135

superstitions about, 4-163, 196

swimming powers, 4-149, 196, 208, 211, 219, \*220, 238

talking, 4-192

trained to catch fish, 4-†212

**tropical**, 4-†177-98, \*68

used as food, 9-318

**water birds**

sea, 4-†200-21

shore and marsh, 4-†100-22, 147, 149, \*185, \*193, †195-98, color plate, \*120

wing and tail sounds, 4-79, 115, 179, 197

**winter residents**, 4-†124-30, †223-30*see also names of species, as Flycatchers; Sparrows, and also names of birds, as Lyre bird; Song sparrow***"Birds, The,"** by Aristophanes, 13-40**"Birds and Poets,"** by John Burroughs, 13-426**Bird's-eye maple**, cause of "eyes," 2-260**Bird's-foot starfish**, 3-\*128**Bird's-foot violet**, 8-106-A**Bird's head bryozoa**, 3-115**Bird's nest**, cup fungus, 2-\*73, 76**"Birds of North America,"** by Audubon, 13-428**Bireme**, sailing boat, 10-163**Birger**, king of Sweden, 6-395**Birger** (of Folkungs), Swedish earl, 6-394**Birgitta (Bridget), Saint**, 6-396**Birkenhead, Lord**, quoted, \*12-449 A**Birmingham, Ala.**, 8-3**Birmingham, Eng.**, commerce, 10-254**Birth**, William Harvey's studies of, 13-361**"Birth of a Nation, The,"** photoplay, 10-507**"Birth of Saint John the Baptist,"** painting by Ghirlandaio, 11-\*144, 145**"Birth of the Navy, The,"** picture, 7-\*203**"Birth of Venus"**

Greek carving, 11-\*41, 42

painting by Botticelli, 11-\*146

**Birth rate**, high in Mississippi, 8-206-A**Birthstones**, 9-433**Birute**, Lithuanian duchess, 6-\*461**Biscay, Bay of**, Europe, maps, 6-578, 580, 590

on map of Europe, 6-570

**Biscoe, John**, Antarctic expedition, 13-506**Biscuit**, unglazed pottery, 12-44**Bise**, wind, 6-254-B**Bishop**, chess piece, 14-487**Bishop, Va.**, "breaker house" of coal mine, 8-\*405**Bishops**, clergymen

appointment in Middle Ages, 5-296, 297

jewels, 12-124, 125

**Bishops' Wars**, Scotland, 6-126**Bismarck**, N. D., industries, 8-301

temperance, 8-302

**Bismarck-Schönhausen, Otto Eduard Leopold von, Prince**, life, main article, 12-†447-49

becomes chancellor, 12-449

brings about Prussian supremacy in Germany, 6-227, 229; 12-449

Congress of Berlin, 6-\*232

marches to Paris, 6-\*216

Napoleon III and, 12-\*448

portrait, 12-\*449

resignation, 6-\*233, 234

rules Germany, 6-†231-34

subordinates Austria to Prussia, 12-448-49

**Bismuth**, element, 2-353

reflected by fluoroscope, 2-353, \*354

symbol, atomic no. and wt., 1-\*551

X-ray work, 10-494

**Bison**, *see* Buffaloes**Bites of snake**, treatment for, 2-408**Bitter, Karl**, sculptor, 11-364**Bitter Root Valley**, Montana, settlement established, 8-217**Bitterns**, birds, 4-103-6, \*109, \*110

nest building and breeding, 4-104

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Bitterroot Range**, Rocky Mountains, 8-92-A  
**Bitumen**, mineral  
   bricks made with, 11-407  
   effect of sunlight on, 10-447  
**Bituminous coal**, 9-438  
**Bivalves**, shellfish, main article, 3-†151-60  
**Bizet, Georges**, 12-253  
   saxophone written for, 12-258-E  
**Bjarni Herjulfson**, 7-110  
**Bjerknes, Jakob**, meteorologist, 1-278  
**Björnson, Björnstjerne**, life and works, 13-98-99  
   Ibsen and, 13-87, 88, 98, 99  
   portrait, 13-98  
**Black**  
   dye, 9-305; 12-157  
   ink, 9-307  
   pigment, color plate, 1-434  
**Black, Joseph**  
   portrait by Raeburn, 11-303  
   toy balloon made by, 10-319  
**Black and Tans** in Anglo-Irish War, 6-161  
**Black-and-white warblers**, birds, 4-58  
**Black antelope**, 4-479  
**Black-backed gull**, bird, 4-†402  
**Black-backed jackal**, 4-302  
**Black Ball Line**, packet ships, 10-173  
**Black-banded rattlesnake**, 3-492  
**Black bass**, fish, 3-238, 239  
**Black bear**, 4-314, †315-17, 318, 319  
**Black beetle** (cockroach), 3-355  
**Black belt of the South**, 7-245  
**Black Butte**, in North Dakota, 8-298  
**Black Canyon of the Gunnison**, Colorado, 7-418, 419  
**Black-capped titmouse**, state bird of Maine, 8-156-A  
**Black cat**, 4-488  
**Black codes**, for control of ex-slaves, 7-268, 269  
**Black-crowned night heron** (quawk), 4-108, 100, 102  
**Black currant**, 9-159  
**Black Death**, plague, 5-309; 6-28, 260, 300, 420  
**"Black Decree,"** Mexico, 7-86  
**Black diamonds**, name for coal, 9-436  
**Black duck**, 4-119  
**Black Eagle Falls**, Montana, name, 7-220  
**Black-eyed susan**, state flower of Maryland, 8-162-B  
**Black-figured pottery**, 12-49, 53  
**Black fly**, 3-337, 388  
**Black Geyser**, New Zealand, 1-36  
**Black Hawk**, Indian leader, 7-474  
**Black Hawk War**, 8-99; 7-474  
**Black-headed grosbeak**, bird, 4-84  
   color plate, 4-89  
**Black-headed (laughing) gull**, 4-201, 203, †402  
**Black Hills**, mountain group in South Dakota and Wyoming, 8-359  
   Custer State Park, 8-364-A  
   discovery, 7-7; 8-360  
   gold, 8-361, 451  
   Wyoming, 8-454  
**Black Hole of Calcutta**, 5-381  
**Black howler monkey**, 4-265  
**Black iguana**, 3-452  
**Black-locust leaf**, 2-24  
**"Black Maria,"** Edison's studio, 10-504  
**"Black Maskers,"** by Andreyev, 13-97  
**Black Mesa**, mountain, Oklahoma, height, 8-320-A  
**Blacknag**, cobra, 3-†485  
**Black-necked stilt**, bird, 4-117  
**Black-necked stork**, 4-195  
**Black-necked swan**, 4-118  
**Black oak**, 2-160  
**Black panther**, 4-292  
**Black Parliament of Ayr**, 12-381  
**Black Patch**, tobacco region of Kentucky, 8-137  
**Black pigmies**, 5-570  
**Black Prairies**, Texas, 8-381  
**Black Prince**, The, *see* Edward (the Black Prince), prince of Wales  
**Black race**, 5-†43  
   Pacific islands, 5-521, 523  
   *see also* Negritos; Negroes  
**Black River**, South Carolina to Waccamaw River, 8-356  
**Black River**, U. S., SE Missouri to White River in Arkansas, length, 10-255  
**Black River**, Wis., 8-446  
**Black rock**, name for coal, 1-344  
**Black salamander**, 3-429  
**Black Sea**, between Europe and Asia  
   maps, 6-602  
   on map of Europe, 6-571  
   Russia's engineering project, 10-262  
**Black Shirts**, Italian party, *see* Fascism  
**Black snake**, 3-501  
**Black swallow-tail butterfly**, 3-288  
**Black Swamp**, region in Ohio, 8-308  
   rich farms opened, 8-309  
**Black swan**, 4-119  
**Black-tailed deer**, 4-407  
**Black tea**, 9-136  
**Black-throated blue warblers**, birds, 4-58  
**Black-throated green warbler**, 4-58  
**Black-throated penguins**, birds, 4-219  
**"Black Tulip, The,"** by Dumas, 13-128  
**Black vultures**, 4-160, 163  
**Black walnut**, 2-270; 9-203  
   extreme age, 2-260  
   wood, 2-159  
**"Black Warrior"** (Tuscaloosa), Indian chief, 8-4  
**Black Warrior River**, U. S., 8-8, 3  
**Black Water State**, 8-228-A  
**Black widow spider**, 3-413  
**"Blackbeard,"** (Edward Teach), pirate, 8-288  
**Blackbeard Island Wild Life Refuge**, 8-84  
**Blackberry**, 9-†156-58  
   blossom, 2-162  
   fruit, 2-118  
**Blackbird**, 4-†45-47, 101, 104  
   English, 4-171  
   European, 4-6

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Blackbird family**  
 bobolinks; cowbirds, 4-89  
 grackles, 4-90  
 meadow lark, 4-87
- Blackbuck**, animal, 4-\*416
- Blackcap**, bird, 4-170
- Blackfoot Indians**  
 moccasins, 9-\*60  
 Montana, 8-216
- Blackfriars**, London theater, 12-329
- Blackheads** in skin, cause of, 2-291, 293
- Black warbler**, bird, graph of song, 4-\*5
- Blacksmith's apron**, used for a flag in Persia, 14-572
- "Blackstrap,"** product of sugar factories, articles made from, 8-416
- Blackwater, Battle of the**, 6-153
- Blackwater Migratory Bird Refuge**, 8-162-A
- Bladder**, anatomy, function, 2-367
- Bladderwort**, plant, insects trapped by, 2-\*63, 64
- Blade**, of leaf, 2-23, 25, \*48
- Blade**, of oar, 14-532
- Blaine, James Gillespie**  
 presidential candidate, 7-286, 287  
 secretary of state, 7-289
- Blair, Robert**, poem illustrated by Blake, 13-212
- Blake, Lyman**, 9-61
- Blake, William, life and works**, main article, 13-†211-13  
 painting, 11-304  
 meeting between David and Goliath, 13-\*211  
 quoted, 11-390
- Blanc, Mont**, mountain peak, France, 1-\*28;  
 6-162-C  
 map, 6-584, A3
- Blanc mange**, made from seaweed, 2-69
- Blanche, Duchess**, Chaucer's poem about, 13-143
- Blanche of Castile**, regent of France, 12-376, 377, 378
- Bland, James**, "Carry Me Back to Ole Virginia" by, 8-418-A
- Bland-Allison Act**, 12-456-C
- Blank verse**, plays written in, 12-331
- Blarney Castle**, Ireland, 6-\*145
- Blarney Stone**, story of, 6-145
- Blast furnace**, 9-†400 fol.; 7-\*29 P  
 tapping, 9-\*401
- Blasting**, explosives used for, 10-†416-18  
 aid to farmer, 10-546
- Bleaching**, sulphur dioxide used for, 1-553
- "Bleak House,"** by Charles Dickens, 13-245
- Bleeders**, sufferers from haemophilia, 2-348
- Bleeding**, first-aid treatment, 2-†406  
 preventive, 10-550  
*see also* Blood
- Blefuscu**, land of, in "Gulliver's Travels," 14-347
- Blenheim**, Germany, British victory, 6-75
- Blenheim Palace**, England, 12-449-A
- Blenkinsop, John**, 10-\*180
- Blenny**, fish, 3-196
- Bleriot, Louis**  
 flight across English Channel, 10-318, 324  
 portrait, 10-\*324
- Blesbok**, antelope, 4-\*419
- "Blessed Damozel, The"**  
 music by Claude A. Debussy, 12-318  
 poem by Dante Gabriel Rossetti, 13-†257
- Blights**, plant, 2-136, 138, 140
- Blimps**, 7-488
- Blind**  
 basket making, 12-134  
 Braille type, 10-60, \*62  
 education, 7-443  
 libraries' aid to, 10-560
- "Blind, The,"** by Maeterlinck, 13-100
- Blind men examine elephant**, 2-†295
- Blind spot of eye**, 2-\*296
- Blind staggers**, cattle disease, cause, 2-205
- Blindman's battle**, game, 14-170
- Blindman's buff**, game, 14-174
- Blindman's dinner**, game, 14-160
- Blindness**, caused by brain injury, 2-389
- Blindworm**, lizard, 3-459
- Blister pearls**, 3-163
- Blisters from sunburn**, 2-288
- "Blithedale Romance, The,"** 13-300
- Blitzkrieg**, lightning war, 6-241; 10-363; 6-\*518
- Blizzard**, 1-252
- Blizzard State**, 8-364-A
- Bloch, Ernest**, 12-257
- Block, Adrian**, Dutch navigator, 8-271  
 and name of Rhode Island, 8-347
- Block books**, printing, 10-48
- Block house**, fort, 11-499; 12-\*470
- Block Island**, island off Rhode Island, 8-271
- Bloemfontein**, Orange Free State  
 meeting place of courts, 5-489  
 taken by British, 5-488
- Bloemfontein Convention**, 5-482
- Blood, composition and function**, main article, 2-†344-50  
 aerated in lungs, color plate, 2-\*279  
 amount in body, 2-377  
 bacteria in, 2-14  
 cause of color, 2-338  
 circulation, 2-†369-81  
 circulatory system, color plate, 2-†327, \*347  
 course of, color plate, 2-frontispiece  
 discovered by Harvey, 13-†360  
 effect of exercise upon, 2-377, 378, 379  
 Leeuwenhoek's discoveries, 2-279  
 organs of, 2-\*352, color plates, \*278, \*279, \*327  
 portal, 2-374  
 systemic and pulmonary, 2-373-74  
 clotting, 2-345, 348  
 corpuscles  
 red, 2-†344-46  
 white, 2-\*346, 347, 349  
 diseases; Ehrlich's work, 10-550  
 heating system of body, 2-347

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Blood**—*continued*

- how germs are destroyed by, 2-344, 349
- how lungs work with, 2-336
- iron in, 9-408
- laboratory tests, 2-\*344
- plasma, 2-345, 347, 348
- proteins, 2-345, 348
- squirited by lizard, 3-457
- studies of Behring and Metchnikoff, 2-344, 349

**Blood Compact**

- Magyars, 6-290
- Philippine Islands, 5-564

**Blood feuds**

- Eskimo, 7-39
- Corsica, 6-472

**Blood poisoning**, caused by bacteria, 2-21**Blood pressure**, measurement, 1-462**Blood vessels**, structure, 2-375

- bursting, at high altitude, 1-456
- flow of blood through, 2-376
- hand, 2-\*348
- lungs, 2-334
- nerve connections, 2-378
- skin, 2-289, \*290, 292
- transfusion, 7-427

*see also* Arteries; Capillaries; Veins

**Bloodhound**, 4-\*499, 501**Bloody Mary**, *see* Mary I, queen of England**"Bloody Sunday,"** 6-438**Bloomer, Mrs.**, bloomers named for, 10-13**Bloomington, Ind.**, 8-109**Blount College**, *see* Tennessee, University of**"Blowing stones,"** 10-30**Blown glass**, manufacturing of, 12-\*30, 31, \*38**Blowpipe**, glass made with, 12-27, \*30, 31**Blubber**, whale, 4-444, 446, 448**Blücher, Gebhard Leberecht von**

- Battle of Waterloo, 12-435
- War of Liberation, 6-\*226

**Blücher shoe**, 9-56**"Bludgeon, The,"** by Émile Zola, 13-135**Blue**, color, color plate, 1-434, 439

- dyes, 9-305
- in lichen, 2-80
- ink, 9-305, 307
- on spinning disk, 1-\*439
- pigment, 1-441
- primary color, 1-440

**"Blue Bird, The,"** by Maeterlinck, 13-100**"Blue Boy, The,"** by Gainsborough, 11-\*301, 302**Blue cat (Maltese)**, 4-488**Blue crab**, 3-183**Blue crane**, heron, 4-107**Blue darter**, hawk, 4-154**"Blue Dick,"** Canterbury windows destroyed by, 12-77**Blue-eyed cockatoo**, 4-\*190**Blue-faced booby**, bird, 4-\*214**Blue-fin whale**, 4-447**Blue-footed booby**, bird, 4-\*11**Blue (arctic) fox**, 4-†305-6**Blue-fronted jay**, bird, 4-\*226**Blue grass regions**

- Kentucky, 8-133, 138-A
- tobacco growing, 8-137
- Tennessee, 8-366
- Virginia, 8-414

**Blue Grass State**, Kentucky's nickname, 8-138-B**Blue Grotto**, Capri, Italy, 1-87

- number of tourists, 6-476

**Blue (marsh) hawk**, 4-154, \*156**Blue-headed vireo**, bird, 4-60, \*61; 5-550**Blue Hen State** (Delaware), 8-66-A**Blue Hen's Chickens**, nickname for people of Delaware, 8-66-A**Blue Hen's Chickens**, Revolutionary regiment, 8-66-A**Blue hermit crab**, 3-94**Blue heron**, bird, 4-\*101, 106, 146; 3-\*232**Blue jay**, bird, 4-174, †226

- color plate, 4-\*88

**Blue Law State**, nickname for Connecticut, 8-62**Blue Laws**, of Connecticut, 8-56**Blue Licks Battlefield**, Kentucky, 8-138-B**Blue Mountain**, Ark., 8-27**Blue Mountains**, Australia, 5-549, \*550

- discovery of gold in, 5-556

**Blue Mountains**, U. S.

- Oregon, 8-331

**Blue Nile**, river, Africa, 5-455, 473 A**Blue penguin**, 4-221**Blue Ridge Mountains**

- South Carolina, 8-356
- Virginia, 8-411

**Blue-shanks** (avocets), birds, 4-118**Blue shark**, 3-198**Blue tits**, birds, 4-†173**Blue vitriol**, *see* Copper sulphate**Blue whale**, 4-\*443**Blue-winged teal**, bird, 4-\*156**Blueberry**, 9-156, \*158, 159

- grown in New Jersey, 8-245

**"Bluebird,"** racing car, 9-\*412**Bluebirds**, 4-†16-19, \*8

- color plates, 4-\*24, \*88
- member of thrush family, 4-18
- Missouri's state bird, 8-212-B
- nest building and breeding, 4-\*16, †17
- voted New York's favorite bird, 8-284-A

**Bluebottle**, fly, 3-358**Bluehill Bay**, ancient graves along shore, 8-149**Blueing**, 10-550**Bluff King Hal**, *see* Henry VIII, king of England**Blum, Leon**, French premier, 6-202**Blumenthal, Maurice**, music to "Arizona" written by, 8-24-A**Blushing**, cause of, 2-381**Bo Tree**, sacred to Buddhism, 13-520**Boa**, snake, 3-†494-99, 500**Boa constrictor**, 3-496, \*499**Boabdil**, Moorish king, leaves Granada, 6-†325**Boadicea**, British queen, war with Romans, 6-5**Boar**, wild, 4-432, \*436**Boards**, artificial, used in building, 9-\*294

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Boat-billed heron**, bird, 4-<sup>\*</sup>144

**Boat racing**, 14-†530-33

**Boat-tailed grackle**, 4-<sup>\*</sup>90

#### Boats

basketwork, 12-†130, 134

corsairs, 5-454

fishing, 9-<sup>\*</sup>361, †363; 6-<sup>\*</sup>337; 8-<sup>\*</sup>173

funeral, 5-<sup>\*</sup>60; 11-<sup>\*</sup>13, <sup>\*</sup>487

ice boat, how to make, 14-†32

kayaks (skin boats), 6-†484, 10-138, †139

models, how to make, 14-†34

Ohio River, 8-307

Phoenician, 5-<sup>\*</sup>110

primitive, 10-†136-40

racing shells, 14-532

reed boats (balsas), 5-<sup>\*</sup>499

river boats of Arabs, 5-<sup>\*</sup>90, <sup>\*</sup>94

Roman house boat, 5-<sup>\*</sup>232

rowboats, 14-531

sailboats, earliest, 10-†159-61, 140

skin boats, 6-<sup>\*</sup>484; 10-†137 fol.

whaling boats, 8-344

*see also* Canoes; Dugouts; Galleys; Rafts;  
Ships; Steamships and steamboats

**Boatswains**, birds, 4-215

**Bobbin lace**, 12 <sup>\*</sup>163, <sup>\*</sup>165, <sup>\*</sup>167-71

**Bobbins**, tapestry-weaving, 12-138

**Bobby**, London policeman, 6-95

**Bobcat**, 4-294, <sup>\*</sup>295

**Bobolinks**, birds, 4-†87-88

color plate, 4-†89

nest building and breeding, 4-†88

**Bobricoff**, oppressive Russian dictator of Finland, 6-457

**Bobsled**, rounding curve, 1-<sup>\*</sup>311

**Bobwhite**, bird, 4-†93-94, †96

nest building and breeding, 4-†96

state bird of

Oklahoma, 8-320-B

Rhode Island, 8-347

**Boccaccio, Giovanni**, life and work, main article, 13-†63-64

contemporaries, 6-299

**Boccherini, Luigi**, Italian composer and musician, wrote for guitar, 12-258-D

**Bocskay, Stephen**, Transylvanian prince, 6-282

**Bodleian Library**, Oxford University, 10-556

#### Body, human

anatomy in art, 11-37, †38, 46, 88, 129

color plates, 2-<sup>\*</sup>326, <sup>\*</sup>327

circulation of blood in, 2-frontispiece

trunk and head, 2-<sup>\*</sup>278

vital organs, 2-<sup>\*</sup>279

danger of painting, 2-293

heat, 2-331

salt important to, 9-413

superiority, 2-280

temperature, 1-<sup>\*</sup>392

water given off, 1-364

*see also* Anatomy; Physiology

**Boeotia**, district of ancient Greece, 5-153

on map, 5-<sup>\*</sup>150

**Boer Wars**, 5-486, 487; 6-101

Canadians in, 7-28

**Boerhaave, Hermann**, 13-411

**Boers**, people, South Africa, history, main article, 5-†484-91

"Great Trek," 5-480

meaning of name, 6-101

relations with Negroes, 5-478, 480, 482

settlement of South Africa, 5-476

wars, 5-486, 487; 6-101; 7-28

**Boethius, Anicius Manlius Severinus**, biography, main article, 13-58

imprisoned by Theodoric, 6-294

portrait, 13-<sup>\*</sup>58

**Boethus**, Greek sculptor, copy of statue by, 11-<sup>\*</sup>69

**Bogoslof Bird Refuge**, 8-16-B

**Bogotá**, Colombia, 5-518-E

airplane line, 5-517

founded, 5-500

**Bogotá, Plain of**, 5-518-E

**Bohea tea**, 9-137

**"Bohème, La,"** opera by Puccini, 12-253

**Bohemia**, prov., Czechoslovakia

bronze working, ancient, 12-16

Ferdinand I recognized as king, 6-261

glassware, 12-<sup>\*</sup>33, 34

music and musicians, 12-256, †308, 310

physical features, 6-290-A

porcelain, 12-<sup>\*</sup>40

Reformation, 6-259

*see also* Czechoslovakia

**Bohemian glass**, 12-<sup>\*</sup>33, 34

**Böhm, Theobald**, flutist, 12-258-A

**Bohol**, island, Philippines

area, 5-570

Legaspi and dato, 5-564

map, 5-595

revolt against Spain, 5-567

**Bohum, Humphrey de**, attacks Robert Bruce, 12-384

**Boi, Paolo** (il Sicacusano), skill at chess, 14-488

**Boileau-Despréaux, Nicolas**, life and work, main article, 13-†114

contemporaries, 12-412

one of "the four," 13-113

**Boiler of steam engine**, 10-†397

**Boiling**, physics, 1-†402-6

water, 1-404, 482

*see also* Boiling point

**Boiling Lake**, Dominica, West Indies, 7-64

#### Boiling point

chart showing boiling points, 1-<sup>\*</sup>392

on thermometers, 1-208

water, 1-<sup>\*</sup>402, 404

**Bois de Sioux River**, South Dakota, 8-364

**Boise**, Idaho, 8-†86

industries, 8-92

rainfall and temperature, 8-92-A

**Boise, Fort**, Idaho, trading post, 8-88

**Boise River**, Idaho, dam, 8-<sup>\*</sup>88

**Bojer, Johan**, 6-390

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Bok, Edward W.**, bird sanctuary, 4-517, \*3  
**Bokhara**, U.S.S.R., 5-435  
**Bolas**, weapon, 4-235  
**"Boléro,"** by Maurice Ravel, 12-254  
**Boleslaw I**, king of Poland, 6-446  
**Boleslaw II**, king of Poland, 6-446  
**Boleslaw III**, king of Poland, 6-446  
**Boleyn, Anne**, queen of Henry VIII, 12-391, 392, 394  
**Bolivar, Simon**, life, main article, 12-†436-38  
     birthplace, 5-517  
     dreams of a United States of South America, 5-506  
     last years; death, 5-507, \*512  
     leads South American revolution, 5-505  
     portrait, 12-\*437  
**Bolivar**, Venezuelan monetary unit, 12-436  
**Bolivia**, republic, So. Amer., description, 5-516;  
     general data, 5-518-D  
     area, 5-518-D  
     basketry boats, 12-\*130  
     climate, 5-518-D  
     divisions, 5-518-D  
     flag, color plate, 14-following 570, no. 7  
     government, 5-518-D  
     history, 5-507, 510, 516  
     republic formed, 12-438  
     location, 5-518-D  
     map, 5-602  
     medicinal plants, 9-217  
     Mount Sahama, 1-28  
     people, 5-518-I)  
     physical features, 5-518-D  
     products, 5-518-D  
     rubber, 9-\*271  
     tin, 9-420  
     rivers, 5-518-D  
**Boll**, cotton, 9-32  
**Boll weevil**, 3-339, \*341; 9-†33  
     airplanes spread poison, 10-322  
     chemicals to control, 10-546  
**Bologna, Giovanni Gian da**, statue by, 11-\*169  
**Bologna**, Italy, uprising in, 6-310  
**Bolshaya**, *see* McKinley, Mt.  
**Bolsheviki**, meaning of word, 6-438; 7-551  
**Bolshevist party** in Russia, 6-†438-43; 12-449†  
**Bolsover, Thomas**, plating discovered by, 12-89  
**Boltraffio**, Italian painter, 11-151  
**Bombers**, airplanes, 10-†368-C-68-F; 7-487  
**Bomb Sight**, 7-486  
**Bombs**, various types, 10-368-B  
     atomic, *see* Atomic bomb  
**Bombardier beetle**, 3-†337  
**Bombay**, India, 5-\*381  
     center of British influence, 5-378  
     export products, 10-237  
     Parsees, 5-106  
     rainfall and temperature, 5-387-A  
     sacred cattle, 5-\*368  
     street scene, 5-\*381  
**"Bon voyage,"** 10-296  
**"Bonanza,"** meaning, 8-220-A  
**Bonanza State**, 8-220-A  
**Bonaparte, Jérôme**, king of Westphalia, 6-226  
**Bonaparte, Joseph**, eldest brother of Napoleon I  
     Naples, 6-306  
     New Jersey, 8-252-A  
     Spain, 5-504; 6-332; 12-430  
**Bonaparte, Napoleon**, *see* Napoleon  
**Bonaparte, Pauline**, as Venus, statue by Canova, 11-291, \*325  
**Bonapartists**, French political party, 6-200  
**Bonasa umbellus**, bird, 8-342  
**Bondone, Giotto di**, *see* Giotto di Bondone  
**Bonds**, 7-529  
     issued by corporations, 7-528, 535  
     Liberty loans, 7-324, 529  
     trading in, 7-581  
**Bone**, uses, 9-331  
**Bone**, anatomy, *see* Bones  
**Bone carving**, 12-95, \*179; *see also* Ivory carving  
**Bone china**, pottery, 12-61  
**Bone surgery**, 2-†406-8, 324  
**Bones, structure and functions**, main article, 2-†318-24  
     blood capillaries in, 2-\*230, \*323, 345  
     bony structure of eyes and nose, 2-\*300  
     ear, 2-†303  
     growth, 2-320  
     glands that regulate, 2-324  
     hardened by vitamins, 2-363, 365  
     horse's foot, 4-506, \*507  
     human skeleton and its parts, color plate, 2-\*278, \*319, †321, \*322, \*327  
     injuries to; treatment and healing, 2-321, 324, †406-8  
     marrow, 2-\*320, 323  
     blood corpuscles made in, 2-345, 348, 349  
     movement by muscles, 2-\*328, †329-31  
     orbital cavity walls, 2-\*298  
*see also bone structures, as* Skull; Spinal column  
**Bonfires**, 6-†253  
     heating with, 10-†370-80  
**Bonheur, Rosa**, paintings, 11-†333  
     "Horse Fair," 11-\*333  
**"Bonhomme Richard,"** ship, battle with "Serapis," 7-\*492, 493; 12-502  
**Boniface VIII**, pope, and Philip IV, 6-170  
**Bonington, Richard Parkes**, English painter, 11-311, 325  
**Bonivard, François**, Byron's poem about, 13-\*226, 227  
**Bonnet, Stede**, pirate, 8-288  
**Bonnet monkey**, 4-†257  
**Bonneville, Lake**, prehistoric, 8-390, 391  
**Bonneville Salt Flats**, Utah, 9-\*412  
**Bonnie Prince Charlie**, *see* Charles Edward Stuart (the Young Pretender)  
**Bonus Expeditionary Force**, 7-\*330, \*337  
**Boobies**, birds, 4-\*214; 7-\*44  
     blue-footed, 4-\*11  
**Book cipher**, used in secret writing, 14-148

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Book manufacture, 10-\***53 fol.

- binding and cover stamping, 10-†63
- composition, 10-†53, †55, †60
- electrotyping, 10-†57
- folding and sewing of signatures, 10-†61
- photo-engraving, 10-†67-71
- printing, 10-†59

**Book of Hours**, John of Berry's, 11-**\***104, 105; 11-†192, 193

**Book of Kells**, 11-84

**"Book of My Friend, The,"** by Anatole France, 13-136

**"Book of the Dead,"** 5-54

**"Book of the Duchess, The,"** by Chaucer, 13-143

**"Book of Travels of Marco Polo,"** 13-446

**Book organ**, 12-**\***225

**Book Plateau**, *see* Roan Plateau

**Bookbinding**, 10-†63

**Bookcases**, Roman, 12-181

**Bookmobiles**, 10-558

**Books**

- ancient Chinese, 5-320, 321
- ancient Greek rolls, 5-172
- before paper was used, 9-273
- block books, 10-48
- Byzantine, 11-79, **\***80
- chained, 10-**\***47, **\***50
- Chaldean, 5-97
- clay
  - Assyrian, 5-92
  - Sumerian, 5-78, 82
- copyright protection, in the United States, 7-381
- early forms of writing and recording, 10-**\***34, **\***35, **\***43-44
- first book printed in America, 7-79
- Irish illuminated manuscripts, 11-84
- libraries, 10-†555-62
- medieval, 11-†84-85, 88
  - Flemish paintings, 11-**\***104, 105, †192, 193
- pictures needed for earliest printed books, 11-207
- sacred, *see* Bible; Koran; Talmud
- scrolls, 10-**\***50
- see also* Book manufacture; Manuscripts

**Boom**, for logs, 9-**\***254, 256

**Boom towns**, in Western U. S., 7-276, 277

**Boomer**, kangaroos, 4-460

**Boomerang**, weapon, how to make, 14-†39

**Boomers' Paradise**, nickname for Oklahoma, 8-320-B

**Boone, Daniel**, life, main article, 12-†469-72

- Boone's Road, 8-135
- monument at Frankfort, Ky., 12-†472
- pathfinding, 14-563
- woodcraft, 14-567

**Boone's Road** (also called Boone's Path or Wilderness Road), 8-135; 12-†471; 14-563

**Boonesborough**, Ky., fort built by Daniel Boone, 12-471

**Boonesborough, Battle of**, 12-472

**Boot**, mandarin, 9-**\***54

**Boot-lace worm**, 3-124

**Boötes** (Herdsmen), constellation, 1-413

star maps showing

- Jan. and Feb., 1-178-A
- July and August, 1-178-G, 178-H
- March and April, 1-178-C
- May and June, 1-178-E, 178-F
- Sept. and Oct., 1-178-I

**Booth**, Edwin, American actor, 12-333

**Booth**, John Wilkes, kills Lincoln, 7-265

**Boothia Peninsula**, magnetic area, map, 10-**\***456

**"Bootlegging" industry**, U. S., 7-336

**Bora**, wind, 6-290-A

**Borah Peak**, Idaho, elevation, 8-88

**Borax**, California's deposits, 8-34, 40

**Borchgrevink**, Carstens, Antarctic explorations, 13-508

**Bordeaux**, France, wine center, 10-256

**Bordeaux mixture**, fungicide, 2-139

sprayed and unsprayed field contrasted, 2-**\***137

**Borden**, Gail, 9-338

**Borden**, Sir Robert, Canadian premier, 7-28, 29, 29-A

**Bordentown**, N. J., Joseph Bonaparte in, 8-252-A

**Border-eagle State**, nickname for Mississippi, 8-206-A

**Border State**, nickname for Maine, 8-156-A

**Borders**, architecture

- Gothic, 11-†474
- Greek, 11-†425

**Bore**, section of wind instrument, 12-258-B

**Boreas**, north wind, 14-433

**Borer**, apple-tree, insect, 3-**\***343

**Borgia**, Caesar, 6-302

Machiavelli's admiration for, 13-70

**Borgia**, Francis, Saint, duke of Gandia, 6-†327

**Borgia**, Lucrezia, 6-**\***300, 302

**Borgia**, Rodrigo, Cardinal, *see* Alexander VI

**Borgia family**, 6-**\***300, 302

attitude of modern historians toward, 5-137

**Borglum**, Gutzon, sculptures; designs for mountain carvings, 11-364

**Boring sponge**, 3-85

**"Boris Godounov,"** opera by Modest Mousorgsky, 12-254

**Borneo**, island, Malay archipelago, description, 5-524; *see also* index World War II, 6-493

animal life

- monkeys, 4-247, **\***254, 257
- squirrel, 4-368

in Indonesian Union, 5-427

map, 5-596

native life and customs, 5-**\***425, **\***427, **\***522

North Borneo, *see* Borneo, British North

once joined to mainland, 3-61

political divisions in, 5-426

resources, 5-529-B, **\***522, 524

**Borneo**, British North, district of Borneo, 5-426

**Bornholm**, island, Baltic Sea

castle of Hammerhus, 6-**\***410

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Bornholm**—*continued*  
 maps, 6-599, 583
- Borodin, Alexander Porfirevich**, one of "The Five" musicians of Russia, 12-313
- Boron**, element, symbol, atomic no. and wt., 1-\*551
- Bors, Sir**, character in Arthurian romances, 14-398, 400
- Borzoi**, dog, 4-\*490
- Bosch, Jerome**, 11-202
- Bosnia**, prov., Yugoslavia  
 absorbed by Yugoslavia, 6-365  
 Austrian occupation, 6-273  
 people, 6-\*365
- Bóss**, architecture, 11-470
- Bossuet, Jacques**, 12-412
- Boston**, Mass., 8-\*173, 174  
 early settlers, 8-167  
 fish market, 8-168  
 map, 8-506  
 newspapers, earliest, 10-74, 76  
 Old State House, 7-\*364; 8-\*166  
 port closed by England, 7-162  
 public library opened, 10-558  
 State House, 8-\*165  
 temperature, 8-176-A  
 terminus of first transatlantic line, 8-170  
 trade and manufactures, 8-170
- Boston baked beans** for campers, 14-\*553, 554
- Boston Common**, 8-165
- Boston fern**, 2-92
- "**Boston Gazette**," 10-76
- Boston Massacre**, 7-161
- Boston Mountains**, Ark., 8-27
- "**Boston News Letter**," 10-76
- Boston Public Library**, 10-558  
 wall paintings, 11-\*364, 366
- Boston State House**, 8-\*165  
 codfish in, 8-169
- Boston Tea Party**, 7-\*159, 162
- Boston terrier**, 4-\*495
- "**Bostonians, The**," novel by Henry James, 13-336
- Boswell, James**, life and work, main article, 13-†195-97  
 with Dr. Johnson, 13-\*192, \*194, \*196
- Bosworth Field, Battle of**, 6-39
- Botanists**, biography  
 Gray, Asa, 13-†412  
 Lamarck, J. B. P. A. de Monet de, 13-†418  
 Linné, Carl von (Linnaeus), 13-†410  
 Mendel, Johann Gregor, 13-†413
- Botany**, main article, definition and branches, 2-1-4 (*see also* Contents Volume 2 for chapter headings)  
 once only the study of medicinal plants, 9-216  
 plant structure revealed by microscope, 2-279; 10-\*487-89  
*see also* Plants
- Botany Bay**, Australia, explored by Captain Cook, 13-\*488, 489; 5-547, 548, \*543
- "**Botany of the Northern United States, Manual of**," by Asa Gray, 13-412
- Botha, Louis**  
 Boer War, part in, 5-587  
 heads South African government, 5-491
- Bothnia, Gulf of**, Europe, maps, 6-596  
 on map of Europe, 6-571
- Bothwell, James Hepburn**, earl of, 12-399
- Böttger, Johann Friedrich**, discovers process for making porcelain, 12-42, 60
- Botticelli, Sandro**  
 becomes follower of Savonarola, 11-147  
 furniture decoration, 12-186  
 paintings, 11-\*122, \*145, †146  
 "Adoration of the Magi," 11-\*122  
 "Birth of Venus, The," 11-\*146  
 "Magnificat," 11-\*145  
 "Mars and Venus," 11-\*122  
 "Primavera," 11-\*145  
 portrait, 11-\*122, 147
- Bottle-blowing machine**, 12-36
- Bottle tree**, 2-\*263
- Bottlenose whale**, 4-446
- Bottles**, glass, 12-\*37  
 "tear" bottles, 12-28
- Bottom lands**, of Mississippi, 8-201
- Bottomless Fountain**, 1-92
- Boucher, François**  
 designs tapestries, 11-308  
 paintings, 11-283
- Bougainville**, Australia, 5-547
- Bouillon, Godfrey of**, *see* Godfrey of Bouillon
- Boulanger, Georges Ernest Jean Marie**, 6-200
- Boulder**, Colorado, 8-47
- Boulder Canyon Wild Life Refuge**, 8-24-A, 234-B
- Boulder Dam**, Nevada, *see* Hoover Dam
- Boulders**, 1-40  
 carried by ice sheets, 3-3, \*34, 1-\*63
- Boulle, André Charles**, furniture by, 12-190
- Bouille work**, decoration, 12-190
- Boulogne, Siege of**, 6-173
- Boulton, Matthew**, 10-401
- Boundary (East) Peak**, Nevada, elevation, 8-234-A
- "**Bounty**," ship, descendants of crew, 5-529
- Bourbon, house of**  
 France, 6-179  
 restored after French Revolution, 6-197  
 Huguenots and, 6-177  
 Italy, 6-306  
 rival of Hapsburgs, 6-214  
 Spain, 6-†328-35  
 call painters to Madrid, 11-306
- Bourbon rose**, breeding of, 2-227
- Bourdelle, Antoine**, sculptor, 11-392; 12-24
- Bourgeoisie**, meaning, 7-436
- Bourse**, at Brussels, 6-\*349
- Bouts, Dirck**, paintings, 11-200  
 "The Entombment," painting, 11-\*199
- Bouvet, Pierre**, voyage in the Antarctic, 13-504
- Bouvines, Battle of**, 5-294; 6-169



- Bow**, musical, 12-258, \*226; 9-313
- Bow River**, Banff, Canada, color plate, 7-\*23
- Bow and arrow**, how to make, 14-†39, †49  
*see also* Arrows
- Bow-wow theory of language**, 10-1
- Bowdoin college**, Brunswick, Maine, 8-155
- Bowen, Sir George Ferguson**, 5-538  
portrait, 5-\*554
- Bower**, room of castle, 5-305
- Bower birds**, 4-†185-86  
nest building and breeding, 4-186
- Bowery**, street, New York, 7-132
- Bowfins**, fishes, 3-†230, 232
- Bowie, James**, inventor of knife, 8-380
- Bowie knife**, 8-380  
Arkansas nicknamed for, 8-28
- Bowie State** (Arkansas), 8-30-B
- Bowline**, knot, 14-\*555
- Bowling alley**, 14-492
- Bowling Green**, New York, in colonial days, 14-†492
- Bowls**, game, 14-†492
- Bowstring hemp**, 2-151
- Box kites** in European armies, 14-500
- Box tortoises**, 3-\*466, \*472, 473
- Boxer Rebellion**, China, 5-333; 7-301
- Boxers**, Chinese society, 7-†301
- Boxing**, sport, 2-\*418
- "Boy and Goose,"** Roman sculpture, 11-\*69
- Boy Scouts**, main article, 14-†541-45  
aid in accident prevention, 2-447  
Daily Good Turn; heroism, 14-544  
membership conditions; oath and law, 14-543  
uniform, 14-551
- "Boy with Heron,"** statue by Frederick MacMonnies, 11-\*376
- Boyacá, Battle of**, 5-505; 12-438
- Boyce, William D.**, 14-542
- "Boyd,"** British ship, crew massacred, 5-536
- Boyle, Robert**  
first camera made by, 10-447  
gas pressure discoveries, 1-462  
theory of matter, 1-282
- Boyle's Law**, physics, 1-463
- Boyne, Battle of the**, 6-155
- Boys**, weight and measurement chart, 2-363
- Boys' clubs**, 7-\*442
- Boysenberry**, 9-158
- Boz**, Dickens' nickname, 13-244
- "Bracebridge Hall,"** by Washington Irving, 13-294
- Bracelets**, 12-\*119, \*121, \*123-25
- Brachiopoda** (lamp shells)  
first appearance on earth, 3-64  
Paleozoic era, 3-9, 15, 18, 24
- Brackenridge, Hugh**, quoted, 7-214
- Braddock, Edward**, in French and Indian War, 7-141, 143; 12-474, 475
- Bradford, William**, governor of Plymouth, 8-166
- Bradford, Eng.**, wool manufacturers, 10-254
- Brahe, Tycho**, life and work, main article, 13-†394-95
- Brahe, Tycho—continued**  
Kepler and, 1-288, 289; 13-398  
observatory at Hveen, Denmark, 6-414  
portrait, 13-\*395  
Rudolphine Tables (catalogue of stars), 13-399  
star discovered by, 1-174
- Brahma**, breed of chicken, 9-\*350
- Brahma** (the Creator), deity, 5-372
- Brahmanism**, Hindu religion, 5-372
- Brahmans**, caste, of India, 5-368 fol., 387
- Brahmaputra River**, sacred river, Asia (Tibet and N. E. India)  
basin area, 10-257  
length, 10-253  
map, 5-586  
outlet, 5-387-A
- Brahms, Johannes; life and works**, main article, 12-301-2  
music, 12-246  
portraits, 12-\*241, \*301  
Schumanns and, 12-290, 302  
triangle used by, 12-258-C
- Brahui**, people of Baluchistan, in Persia, 5-106
- Braided rug**, how to make, 14-†77
- Braila**, Roumania, port on Danube, 10-259
- Braille, Louis**, printing for blind invented by, 10-62
- Braille**, printing for the blind, 10-60, \*62
- Brain, structure and functions**, main article, 2-†383-90  
Alcmaeon connects brain with thinking, 13-4  
and vital organs of body, 2-\*335  
association areas, 2-390  
bone covering, color plate, 2-†278  
color plates, 2-†278, \*326  
control of blood-supply, 2-379  
control of muscles, 2-326, 329, 331, 339  
control of nervous system, 2-395  
diagram of section through, 2-\*387  
effect of injuries to, upon sense organs, 2-389  
Gall's phrenology, 2-383, 388  
higher, 2-339  
influence upon digestive process, 2-354  
loss of blood to stomach, 2-379  
lower, 2-326  
motor centers, 2-388  
respiratory center, 2-340  
scientists' studies of, 2-384, 388  
experiments on animals, 2-384, 387, 388  
senses and, 2-296  
why left side controls right side of body, 2-388  
*see also* Head; Nervous system
- Brain coral**, 3-100, \*101
- Brain stem**, 2-†385
- Brakes**  
air brakes, 1-†461, 462; 10-196  
automobile, 10-†291  
care of, 2-441  
railway, 10-196
- Braking distance**, in driving automobile, 2-437
- Bramante, Donato d'Agnolo**  
brings Raphael to Rome, 11-167

- Bramante, Donato d'Agnolo**—*continued*  
 plans for St. Peter's, Rome, 11-484
- Bramble fruits**, 9-158
- Bran**, removed from wheat, 9-234, 236
- Branca, Giovanni**, steam engine, 10-†396
- Branch libraries**, 10-558
- "Brand,"** by Ibsen, 13-88
- Brandenburg, Carline**, a Thackeray heroine, 13-\*241
- Brandenburg, prov.**, Prussia  
 given to Hohenzollerns, 6-217  
 map, 6-582
- Brandenburg Gate**, Berlin, 6-\*236
- Branding of beggars**, England, 6-54
- Branding of cattle**, 9-\*319, 320
- Brandt, Carolina** (Frau Carl von Weber), 12-282
- Brandt's cormorant**, bird, 4-\*211
- Brandywine, Battle of**, Lafayette's part in, 12-453
- Branick rats**, 4-\*383
- Brant, Isabella**, wife of Peter Paul Rubens  
 beauty; in art of Rubens, 11-222  
 portrait, 11-\*219
- Brantford, Ontario**, 10-\*111
- Braque, Georges**, paintings, 11-390
- Brass, alloy**, 9-419; 1-\*392
- Brass instruments**, 12-258, 258-B-258-C
- Brassie, golf club**, 14-497
- Brasstown Bald**, city, Georgia, elevation, 8-84
- Brattleboro, Vt.**  
 Fort Dummer, 8-399  
 organ manufacture, 8-402
- Bray, Thomas, Dr.**, libraries established by, 10-556
- Brazier from Pompeii**, 12-\*179
- Brazil**, country, South America, description, 5-512; general data, 5-518-F  
*agriculture, see agricultural products and industries listed below under products and industries*  
 animal life  
   armadillo, 4-455  
   birds, 4-61, 88, 178, 203  
   jaguar, 4-292  
   monkeys, 4-262, 263, 267  
   porcupine, 4-\*378  
   sea cow, 4-442  
   toads and frogs, 3-426  
   turtle, 3-480  
 area, 5-518-F  
 becomes Portuguese possession by Line of Demarcation, 6-341, 342; 5-496  
 center of Portuguese empire, 5-507  
 climate, 5-518-F, 518-B  
 flag, color plate, 14-following 570, no. 8  
 government, 5-518-F  
 history, 5-500, 507, 512, 517  
   discovery, 5-497  
 location, 5-518-F  
 map, 5-603  
 mixed races, 5-500  
 only independent monarchy in New World, 5-508
- Brazil**—*continued*  
 people, 5-518-F  
 primitive boat, 10-\*160  
 physical features, 5-518-F  
 potential water power, 5-518-A  
 products and industries, 5-518-F, 513  
   canning, 9-196  
   cassava, 9-211  
   chocolate, 5-513  
   coffee growing, 5-513, \*514; 9-130  
   diamonds and diamond mines, 9-430; 5-513  
   fruit growing, 9-175, 196  
   ipecac, 9-219-A  
   iron deposits, 9-408  
   nut exportation, 9-203  
   orange growing, 9-175  
   rosewood, 9-258  
   rubber, 9-263, 264  
   textile industry, 9-29  
   tobacco, 9-223  
 provinces, 5-518-F  
 rivers, 5-518-F  
 sailboat, 10-\*160  
 trade, 10-241  
   coffee export, 5-\*514  
   merchant marine, number, 10-232  
   nut, 9-203
- Brazil nuts**, 9-\*201, 203
- Brazilian Highlands or Plateau**, 1-29; 5-518-A  
 rivers, 5-518-A
- Brazos River**, U. S., in Texas, 8-386
- Bread, history of bread-making**, main article, 9-†238-43  
*Indian word for*, 8-296-A  
*kinds of flour used for*, 9-239, 243  
*leavened*, 9-239  
*machinery used in making*, 9-\*242  
*mold*, 2-†74  
*primitive methods of making*  
   Palestine, 5-\*140  
   Syria, 5-\*108  
*unleavened*, 9-240  
*see also* Flour and flour mills
- Bread-and-butter letter** termed a "Collins," 13-208
- Bread and Butter State**, 8-198-A
- Bread line**, 7-\*336
- "Breadbasket of the Nation,"** Iowa, 8-\*120
- Breadfruit**, 9-196, †212; 2-151
- Breaker house**, of coal mine, 8-411
- Breastbone**  
 bird, 4-232  
 heart protected by, color plate, 2-\*278
- Breath and breathing**, 2-334  
 animals  
   centipedes and millepedes, 3-267  
   crabs, 3-176  
   crocodiles, 3-438  
   fishes, 3-†196, 252  
   insects, 3-274  
   mollusks, 3-142, †152  
   sponges, 3-83

**Breath and breathing, animals—continued**

water insects, 3-394, 397, 400, 401

whales, 4-444

man, 2-†333-42

artificial respiration, 2-†408-10

color plate, 2-\*326

effect of mouth breathing upon teeth, 2-312

organs of, 2-\*352

rate; changes in, 2-340

while swimming, 14-540

*see also* Lungs

plants, 2-†48-53

**"Brébeuf and His Brethren,"** by E. J. Pratt,

7-29-1; 13-581

**Breckinridge, John C.,** presidential candidate,

7-250

vice-presidency, 12-456-F

**"Breda, Surrender of,"** painting by Velasquez,

11-254

**Breeding, Mendel's laws of heredity,** 13-413*see also* Plant breeding**Breed's Hill, Battle of** Bunker Hill on, 7-164**Breezes,** sea and land, 1-†231**Breitenfeld, Battle of,** 12-402**"Bremen,"** airplane, 10-\*324**"Bremen,"** ship, speed record, 10-224**Bremen, Germany, industry,** 10-257**Brennan, Louis,** invents monorail car, 1-\*291**Brenner Pass,** in Tyrol, map, 6-586, A3**Brest-Litovsk, Treaty of,** 6-439**Bretigny, Treaty of,** 6-27, 174**Breton Jules**

"Close of Day," painting, 11-\*334

"Gleaner," painting, 11-\*330

**Breton Island Bird Refuge,** 8-146-A**Bretons, people,** famous as sailors, 13-473**Brett, John W.,** aids laying of Atlantic cable, 10-103**Breughel, Peter,** paintings, 11-202

"Fall of Icarus, The," painting, 11-\*190

"February," 11-\*190

**Brewster, William, Elder,** on the "Mayflower," 7-\*127**Brewster chair,** 12-\*198**Brian Boru** (Brian of the Tribute), king of Ireland, 6-147**Brice's Cross Roads,** battlefield site, 8-206**Bricks, how made,** 9-376, †378

earliest made, 5-\*78

glass, 10-548

invention, 11-403, 404, 407

made by Arabs, 5-\*94

*see also* Clay; Glazing**Bridal chest,** 12-185**Bridal costume,** Hungarian, 9-\*2**Bridalveil Falls,** in Yosemite National Park, 7-409**Bridge, in billiards,** 14-\*479, \*480**Bridge, ships,** 10-\*302**Bridge-building Friars,** 10-151, 213**Bridge grafting of plants,** 2-\*231**"Bridge of Sighs,"** Venice, 11-\*486**Bridgeman (John Avery), pirate,** 10-170**Bridgeport, Conn., manufacturing,** 8-60**Bridger, James,** 8-392**Bridges, main article,** 10-†209-14

arched, 10-\*210, \*211, 212, 214

center of city life, 10-213

compressed air used on construction, 1-462

George Washington Memorial Bridge, expansion and contraction of cables, 1-478

Golden Gate, 10-\*214; 8-\*39

modern, 10-†210-14

primitive and makeshift, 10-†209

Roman, 11-61, \*437, 438

Ponte Margherita, 6-\*315

Roumania, 6-\*361

steel, 10-\*211, \*212, \*213, 214; 6-\*361

Triborough, 8-\*270

truss, 10-443

Venice

"Bridge of Sighs," 11-\*486

"Rialto," 11-\*487

woven, 5-\*467

**Bridges, natural**

Utah, 8-396-A; 1-\*96

Virginia, 1-†53

**Bridget (Birgitta), Saint,** 6-396**Bridgeton, N. J.**

glass manufacture, 8-247

temperature, 8-252

**Bridgewater Canal,** England, 10-186**Bridled titmouse,** bird, 4-\*63**Brie cheese,** 9-348**Brienne, Battle of,** 6-\*435**Brig, sailboat,** 10-171**Brigade, United States Army,** 7-477**Brigantine, sailboat,** 10-171**Bright, Charles,** Atlantic cable engineered by, 10-102, 103**Bright, John,** 6-95**Bright Angel Trail,** in Grand Canyon, 8-19**Brill, fish,** 3-204**Brimstone, *see* Sulphur****Briquettes, coal,** 9-444**Brisbane, Australia, penal settlement,** 5-544**Bristle worm,** 3-\*121, 123

companion of crab, 3-182

**Bristol, Conn., city charter,** 8-62**Bristol, England, glass manufacture,** 12-34**Bristol, Va., Dogwood, Festival,** 8-418-A**Bristol Bay, Alaska, map,** 8-560**Bristol Channel, England, map,** 6-573**Britain, now England, main article,** 6-†1-11

basketwork huts and boats, 12-130

Christianity, 6-†6 fol.

costume in, 9-12

history, 6-†1-11

Arthur repulses Saxons, 14-377

discovered by Phoenicians, 5-109, \*111

distribution of early peoples, 6-\*5

division of, after Anglo-Saxon Conquest, 6-\*5, 9

Irish raids, 6-144

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Britain, history—continued**

Julius Caesar in, 5-\*223, 224; 6-4; 9-419

Roman conquest, 6-4, \*15

*see also* England, history

name changed to England, 10-10

Roman ruins, 12-111

**British art**

painting

landscape artists; Pre-Raphaelites, 11-†311-20

portrait painters, 11-†293-304

Van Dyck's work in England, 11-225 fol.

**British Columbia**, prov., Canada, 7-29-V-W;

area, 7-33-B

early settlement, 7-29-L

fisheries, 7-\*27

history, 7-24

Indians, 7-†98, \*105

map, 7-592

national parks, 7-29-W

natural resources, 7-29-V, 29-W, 33-B

organized, 7-19

Parliament House, 7-\*24

population, 7-33-B

weaving of Indians, 12-\*135

**British Commonwealth of Nations**, 6-106;

7-33-D-E

Australia, 5-543

Canada, 7-23, 29-B, 33-D-E

coal, 9-439

flags, 14-facing \*572, 573

map, 6-\*107

New Zealand example of dominion, 5-541-B

position of dependencies, 5-386

Union of South Africa a dominion, 5-491-B

**British crafts**

bronze work, 12-\*16

carving, 12-107, 192

furniture, 12-†182 fol.

glass, 12-\*33, †34

gold and silver, 12-\*87, \*89, 90

ironwork, 12-8

laces, 12-\*169, 172

pottery, 12-\*40, 61

stained glass, 12-77

**British dominions**, definition, 7-33-A

merchant marine, number of, 10-232

**British East India Co.**, *see* East India Co., English**British empire**, *see* British Commonwealth of Nations**British Guiana**, colony, So. Amer., map, 5-602

bauxite, 9-422

boundary arbitration, 7-290

*see also* Guiana**British Honduras**, colony, Central America, description, 7-45

location, 7-41

map, 7-598

**British Isles**, 6-108-B; maps, 6-570; 13-502-A

Celtic and Germanic tribes in, 5-268, 269, 271

earliest voyages to, 13-494

**British Malaya**, description, 5-426; general data, 5-430-A-430-B**British Museum**, London

Elgin Marbles, 5-\*16, 18; 11-\*422, 423

excavations in Iraq, 5-\*75

frieze from temple of Apollo at Bassae, 5-18

Greek sculptures from Mausoleum at Halicarnassus, 11-53

library, 10-560

Parthenon frieze, 5-\*16, 18; 11-46

**British New Guinea**, *see* Papua**British North America Act**, 7-20, 33 D-G**British North Borneo**, Malay archipelago, 5-523**British Somaliland**, Africa, map, 5-576**British Thermal Unit (B. T. U.) of heat energy**, 1-407**British West Indies**, description and history,

7-†54-56, 62-66; general data, 7-54-A-54-B

area and location, 7-54-A

climate, 7-54-B

government, 7-54-B

people, 7-54-B

physical features, 7-54-B

**Britons**, Celtic people, 5-268

Druidism, 6-\*1, \*6, \*8

enamel work, 12-64

iron weapons, 12-4

Scotland, 6-111

Wales, 6-137

*see also* Celts**Brittany**

people, type, 6-202-B

sailors, 13-473

wooden shoes, 9-57

**Brittle starfish**, 3-\*128, 133, 134**Broad-billed flycatcher**, bird, color plate, 4-\*184**Broad River**, North Carolina and South Carolina

North Carolina, 8-296

South Carolina, 8-356

**Broad Street**, Newark, N. J., view, 8-\*246**Broadcasting**, radio, 10-\*115, \*119, \*120, 121, 121-A-21-G

Australia, 5-560-H

nightingale's song, 4-170

Roosevelt's addresses to the people, 7-341

weather reports, 1-276

**Brobdignag**, country in "Gulliver's Travels," 14-343**Broca, Paul**, study of brain, 2-384**Broccoli**, vegetable, 9-148, \*149**Broches**, bobbins, 12-138**Brocken, Specter of the**, explained, 1-\*425**Brockton**, Mass., center for the shoe industry, 8-173**Broken bones**, first aid, 2-†406-8

bandaging, 2-\*207

**Broken Hill**, New South Wales, silver mines, 9-388**Bromide of silver**, use on photographic films, 10-449, 451**Bromine**, element, properties, 1-538; 8-295

symbol, atomic no., and atomic wt., 1-\*551

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Bronchial tubes**, anatomy, 2-\*334
- Bronck, Jonas**, 7-†131
- Brontë, Anne**, life and works, main article, 13-†247-48
- Brontë, Charlotte**, life and works, 13-†247-48
- Brontë, Emily**, life and works, 13-†247-48
- Brontops**, prehistoric animal, ancestor of rhinoceros, 3-52
- Brontosaurus**, prehistoric animal, 3-41, \*433
- Bronx**, river and district, New York City, 7-131  
largest real estate sale, 7-536
- Bronx Park**, New York City, rocking stone, 1-\*60
- Bronze Age**, 12-†13-16; 9-399, 419  
beginnings of, 5-40  
civilization, 5-\*37  
lake dwellers, 6-244  
overlapping of Iron Age with, 12-6  
Scandinavia, 12-16, 6-373
- Bronze in art**, main article, 12-†12-24  
casting,cire perdue method, 12-18  
chariot, 9-\*420  
church decoration and ornament, 12-20, \*21  
composition, 12-12; 9-419  
doors, most beautiful in world, 12-22, \*23, 11-127, 128  
earliest, 12-†12-19  
engraved and damascened, 12-180  
for machinery, 12-24  
importance to man, 11-8  
introduction into Europe, 5-40  
knowledge of scattered by early traders, 12-14  
new methods of making, 12-24  
patina, 12-24  
restoration of, 12-24  
styles  
American, 12-24; 11-\*358, \*376  
British, 12-\*16  
Chinese, 12-\*15, 19  
Cretan, 12-13  
Egyptian, 12-13, \*15, 11-8  
Etruscan, 12-\*15, †18, \*19; 9-\*420  
French, 12-22, 24, 107  
German, 12-\*22  
Greek and Roman, 12-†14-18  
Italian, 12-\*12, \*20, \*21, 22, \*23  
medieval, 12-20  
modern, 12-24  
Mycenacan, 12-\*13  
Scandinavian, 12-14, 16  
Spanish, 11-†246  
tempered, 12-13  
weapons, 10-350; 11-8
- Bronze and purple grackle**, color plate, 4-\*25
- Bronzed grackle**, 4-\*90, 91  
feeding young, 4-\*7
- Brooches**, 12-\*87
- Brood pouch** of fish, 3-215
- Brook Farm**, Utopian experiment, Roxbury, Mass., 7-244  
Emerson's services, 13-305  
Hawthorne's sojourn, 13-300
- Brooker, William**, "Boston Gazette" published by, 10-76
- Brookline, Mass.**, library for children, 10-556
- Brooklyn Bridge**, New York, 10-†214
- Brooklyn Heights**, Washington's retreat from, 7-167
- Brooks, Joseph**, American politician, 8-29
- Brooks, N. C. (Captain)**, discovers Midway Islands, 8-464
- Brooks, Richard E.**, statue by, 11-\*376
- Brooks Range**, mountains, Alaska, 8-16  
map, 8-560
- Broom**, made from broom corn, 9-314
- Broom corn**, 9-\*313, †314
- "Brother and Sister"**, fairy tale, text, 14-†186-87  
color plate, 14-\*186
- Brother John**, see Angelico, Fra
- Brotherhood of man**, Zeno's belief in, 13-12
- "Brothers Karamazov, The"**, by Dostoyevsky, 13-95
- Brouwer, Adrian**, art, 11-266  
"The Smoker," painting, 11-\*264
- Brown, Arthur Whitten**, flight across Atlantic, 10-320  
portrait, 10-\*327
- Brown, Ford Madox**  
Chaucer reading before Edward III, painting, 13-\*142
- Brown, George**, 7-20
- Brown, John**, life, main article, 12-†533-34  
raid at Harper's Ferry, 12-534; 7-250  
raid on Pottawatomie Valley, 8-128  
trial, 7-\*249  
West Virginians' opinion of, 8-433
- Brown, Robert**, demonstrates molecular movement, 1-357
- Brown Thomas Gore**, 5-538
- Brown, Will M. S.**, composer of "Our Delaware," 8-66-A
- Brown bat**, 4-273
- Brown bear**, 4-\*312, \*315  
Alaskan preserve, 8-16-A
- Brown booby**, 4-\*214
- Brown creeper**, bird, 4-†126  
nest building and breeding, 4-126
- Brown dwe**, 9-446
- Brown hyena**, 4-309
- Brown race**, 5-†43  
Pacific islands, 5-521, 522
- Brown salamander**, 3-429
- Brown Shirts** (Nazis), German political party, 6-240
- Brown Swiss cattle**, 9-332, \*333
- Brown thrasher**, (brown thrush), bird, 4-†55  
Georgia's state bird, 8-84-A
- Brown trout**, 3-\*236
- Brown University**, Providence, R. I., 8-346  
University Hall, 8-\*344
- Browne, Charles Farrar** (Artemus Ward), and Mark Twain, 13-329
- Brownian movement**, in bacteria, 2-15

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- "Brownies," fairy tale, text, 14-†210-11  
color plate, 14-\*210
- Browning, Elizabeth Barrett (Mrs. Robert Browning), life and works, 13-251, 253**  
portrait, 13-\*253
- Browning, John M., weapons invented by, 10-368-D**
- Browning, Robert, life and works, main article, 13-†251-52, 253**  
portrait, 13-\*251
- Brownson's Deep, 7-60**
- Brownstone State, nickname for Connecticut, 8-62**
- Bruce, Edward, king of Ireland, 6-149**
- Bruce, James, mocked for stories about Abyssinia, 5-448**
- Bruce, Robert de (Robert I), king of Scotland, life, main article, 12-†382-84**  
Bannockburn, 12-384; 6-115  
crowned king, 12-383  
death, 12-384; 6-116  
grants privileges to Edinburgh, 6-\*115  
heart taken to Holy Land, 12-384  
in literature, 6-†114  
Ireland aided, 6-149  
spider story, 12-382, \*383  
wins independence for Scotland, 6-113-15
- Bruce, Robert, lord of Annandale, claims Scottish throne, 6-113**
- Bruce, Stanley Melbourne, Australian premier, 5-560-B**
- "Bruce, The," poem, 6-114**
- Bruche, E., electron microscope, 10-489**
- Bruckner, Anton, composer, portrait, 12-\*241**
- Bruges, Belgium, description, 6-348**  
center of wealth and art in fifteenth century, 11-197  
revolt, 6-347
- Bruises, treatment for, 2-402**
- Brundisium, Italy, terminal of Appian Way, 10-151**
- Bruneau River, Idaho and Nevada, 8-234-A**
- Brunei, sultanate in Borneo, 5-426**
- Brunelleschi, Filippo**  
association with Donatello, 11-126  
befriends Masaccio, 11-132  
carvings, 11-†125, 126  
designs churches and palaces in Florence, 11-\*482, 484  
ironwork, 12-\*5  
study of classic art, 11-127  
Vasari's painting of Ghiberti and, 11-\*482
- Brunhild, Queen, in "Nibelungenlied," 14-310, 313**
- Bruno, Saint, in stained glass, 12-\*72**
- Brunswick, Ga., commerce, 8-83**
- Brunswick, state, Germany, map, 6-582**
- Brusa, Asia Minor, taken by Turks, 5-411**
- Brush, George DeForest, paintings, 11-†356, 361**  
"In the Garden," painting, 11-\*356  
"Mother and Child," 11-\*356
- Brush-tongued parrots (lories), 4-192**
- Brussels, Belgium, description, 6-\*346, \*349, 350**  
Arcade du Cinquantenaire, 6-\*346  
art and artists, 11-200  
lace, 12-\*169, 171  
language, 6-355-B  
rainfall, 6-355-B  
tapestry weaving, 12-142
- Brussels carpet, 12-159**
- Brussels sprouts, buds, 2-\*134**  
freak of cabbage family, 9-148
- Brutus, Lucius Junius, condemns his sons to death, 5-\*201**
- Brutus, Marcus Junius**  
Horace joins army of, 13-50  
opposition to Octavian, 12-362  
part in Caesar's assassination, 12-\*358, 359
- Bryan, John Neely, Dallas settlement founded by, 8-378**
- Bryan, Rebecca (Mrs. Daniel Boone), 12-470**
- Bryan, William Jennings**  
"Crown of Thorns" speech quoted, 7-292  
free-silver candidate, 7-292  
political activities, 7-305, 310, 311  
portraits, 7-\*305; 12-\*549
- Bryant, William Cullen, life, 13-297-98**  
New York "Evening Post" edited by, 13-298  
portrait, 13-\*298  
use of word, "Oregon," 8-332
- Bryce Canyon, Utah, 8-396. A; 7-409; 1-\*18, \*38**
- Bryce Canyon National Park, 8-396-A**
- Bryozoa, moss animals, 3-\*105, †114-15**
- B. T. U. (British Thermal Unit) of heat energy, 1-407**
- Bubbles, fish nests made of, 3-233**
- Bubbles, game, 14-161**
- Buccaneers, origin of name, 10-170; see also Pirates and piracy**
- Bucchero ware, 12-\*52**
- Bucephalus, horse, tamed by Alexander of Macedon, 12-347**
- Buchan, David, 13-496**
- Buchanan, Franklin**  
Battle of Mobile, 7-264  
superintendent of Naval School, 7-487
- Buchanan, J. A., song by, 8-332**
- Buchanan, James, president of the U. S., 12-456-B; 7-250**  
social life during presidency, 12-563
- Bucharest, Roumania, 6-360**  
location, 6-368-A  
rainfall and temperature, 6-368-A
- "Buck in the Snow, The," poem by Edna St. Vincent Millay, 13-353**
- Buckeye chestnut, 8-312**
- Buckeye State (Ohio), 8-312**
- Buckeyes, people of Ohio, 8-312-B**
- Buckingham Palace, London, 6-\*93**
- Buckinghamshire, England, laces, 12-\*169**
- Buckskin, leather, 9-72**
- Buckthorn, plant, green dye from, 12-157**
- Buckwheat, 9-119, 120; 2-\*124**
- Bud, plant, see Buds**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Bud grafting**, 2-\*231  
 rubber yielding tree, 9-\*264  
**Buda**, *see* Budapest  
**Budapest**, Hungary, 6-282, \*283, \*285; 10-259, \*262; map, 6-586, E3  
 Coronation church, 6-\*283  
 location by lat. and long., 6-290-B  
 Millennial Dict greets Francis Joseph, 6-\*286  
 Parliament Building, 6-\*277  
 rainfall and temperature, 6-290-B  
 trade, 10-259  
 Turkish occupation, 6-281  
 Turks driven out of, 5-412; 6-\*282  
 world's fair, 1896, 6-286  
**Buddenbrooks**, novel by Thomas Mann, 13-288  
**Buddha (Siddhartha Gautama)**, life and teachings, main article, 13-†518-20, 5-369  
 Adam's Peak legend, 5-387-B  
 Chinese images of, 5-325  
 Great Buddha, statue, at Nara, Japan, 5-346  
 meaning of name, 13-518; 5-369  
 representations of, 13-†519  
*see also* Buddhism  
**Buddha of the Enlightenment**, statue, at Gaya, India, 5-\*346  
**Buddhism**, religion, 13-520; 5-370  
 Annam, 5-430  
 China, 5-319  
 custom of depositing shoes, 9-56  
 "Eightfold Path," 5-370  
 India, 5-369, 71  
 Japan, 5-345, 346  
 Lamaism in Mongolia and Tibet, 5-437, 439, 440  
 monasteries, 5-370  
 Nirvana, 5-370  
 Siam, 5-428  
**Budding**, botany, *see* Bud grafting  
**Budding**, reproduction by  
 coral polyp, 3-98, 102  
 sea anemone, 3-95  
 sponge, 3-84, 87  
**Budge**, Don, tennis player, 14-464  
**Budgerigars**, love birds, 4-192  
**Budget system**, U. S., 7-374  
**Buds**, plant, main article, 2-†131-34, \*48  
 adventitious, 2-133  
 axillary, 2-†132  
 dormancy, 2-219  
 dormant, give bird's-eye effect in wood, 2-260  
 imbedded, 2-132  
 opposite, 2-132  
 leaf, flower, and mixed, 2-132  
 onion, 2-32  
 sessile, 2-131  
 terminal, 2-132  
 whorled, 2-132  
**Buena Vista**, Mexico, taken by Zachary Taylor, 7-238  
**Buenos Aires**, Argentina  
 commerce, 10-241; 5-\*513  
 founded, 5-499  
**Buenos Aires**---continued  
 harbor, 5-518-11  
 history, 5-505, 514  
 Palace of Congress, 5-\*513  
 rainfall and temperature, 5-518-G  
 situated in a federal district, 5-513  
 third largest American city, 5-515  
**Buffalo**, N. Y.  
 access to markets, 8-269  
 general view, 8-\*271  
 industries, 8-280; 9-236  
 transit part, 10-247  
**Buffalo Bayou**, Texas, battle at, 12-516  
**Buffalo Bill**, *see* Cody, William Frederick  
**Buffalo gnat**, 3-388  
**Buffaloes**, 4-†390-95; 7-†277; 9-\*320, 332; 13-\*484  
 appearance in India, 3-57  
 assemble with zebras, 4-352  
 disappears with cultivation of land, 7-468  
 old world, 4-†392-95  
 prehistoric art depicts, 11-\*1, †3-4  
 extinction of; remnants left, 7-279  
 hunting of, 9-\*320  
**Buffalo Plains State**, 8-52-B  
**Buffalo National Park**, Canada, 7-29-V  
**Buffon**, Georges Louis Leclerc, comte de, life and work, main article, 13-†419-21  
 portrait, 13-\*421  
**Buffoon**, origin of term, 12-237  
**"Bug Eaters,"** 8-228-A  
**Bug-eating State**, 8-228-A  
**Bug River**, Poland  
 length, 10-253  
 map, 6-604  
**Bug River**, Western Ukraine, Europe to estuary of Dniiper, 10-261  
 length, 10-253  
 map, 6-601  
**Bugle**, musical instrument, 12-255-B  
**Buglet**, jet beads, 12-34  
**Bugs**, 3-\*333, 370  
 distinguished by sucking beak, 3-370, 402  
 water bugs, 3-†402-4, \*396  
**Buhl work**, *see* Boulle work  
**Building construction**  
 "artificial wood," 9-†294  
 chemistry's contributions to industry, 10-547, 548  
 fireproofing, 1-385; 9-385; 11-518  
 heating and ventilation, 10-†379-85  
 insulating boards; materials, 9-†294  
 materials, 9-†375-86  
 modern factory, 7-†558  
 skyscrapers, 11-†510, 515-24; 9-380  
 sound-proofing, 1-447  
*see also* Architecture; Shelter  
**Building projects**, *see* Things to make  
**Bukovina**, division of Roumania, timber, 6-368-B  
**Bulb**, underground stem, 2-33  
**Bulbs**, flower, of Holland, 6-354  
**Bulbs**, melonlike, of furniture, 12-188

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Bulfinch, Charles**  
 designed Boston State House, 11-511  
 entrances improved by, 11-505
- Bulgaria**, Balkan monarchy, Europe, description and history, 6-†362-63; 5-414; general data, 6-368-A  
 agriculture, 6-368-A, †362, 363  
 area, 6-368-A  
 climate, 6-368-A  
 flag, color plate, 14-following 570, no. 9  
 government, 6-368-A  
 location, 6-368-A  
 maps, 6-595, 571  
 perfumes, 6-†362, 363; 9-\*300, 301  
 people, 6-368-A, †362-63  
 physical features, 6-368-A  
 products and industries, 6-368-A; *see also*  
   index World War II, 6-493  
 rivers, 6-368-A  
 transportation, 10-259
- Bulgars**, early people who conquered Bulgaria, 6-368-A
- Bull, John**, *see* John Bull
- Bull, Ole**, and Grieg, 12-303
- Bull** (Taurus), constellation, 1-178  
 star maps showing  
   Jan. and Feb., 1-178-B  
   March and April, 1-178-C, 178-D  
   Nov. and Dec., 1-178-L  
   Sept. and Oct., 1-178-I  
 zodiac, 1-\*170
- Bull, Cretan**, and Hercules, 14-429
- Bull baiting**, sport, 4-493, 490
- Bull bat** (nighthawk), 4-\*97, 98
- Bull-Moosers** (Progressive party), 7-311
- Bull-Pringle House**, Charleston, S. C., 11-\*504
- Bull Run, First Battle of**, 7-260; 12-539
- Bull snakes**, 3-500
- Bull terriers**, 4-\*497
- Bulldogs**, 4-\*493 fol.
- Buller, Sir Redvers H.**, in Boer War, 5-487
- Bullets**, ammunition, 10-361  
 flight of, 1-287  
 lead, 9-418
- Bullfighting**, in Mexico, 7-\*86
- Bulfinch**, bird, 4-†172
- Bullfrog**, 3-†422
- Bullhead catfish**, 3-242
- Bullion**, gold, shipment of, 7-†511
- Bullion State**, 8-212-B
- Bullock cart**, Siam, 5-\*429
- Bulls in art**  
 Cretan, 11-\*31, 32  
 Farnese Bull, 11-\*66  
 Persian, 11-\*28  
 Sumerian, 11-\*23
- Bulls, sacred**  
 Egypt, 5-\*67  
 India, 4-394
- Bulls, stock brokers**, 7-581
- Bull's head and garlands**, ornament, 5-\*4
- Bülöw, Hans Guido von**  
 and Richard Strauss, 12-315  
 praises Brahms, 12-302
- Bulwer-Clayton Treaty**, 12-456-E
- Bulwer-Lytton, Edward George Earle Lytton, Baron Lytton**, "Last Days of Pompeii," 12-110
- Bumblebees**, 3-†297-300, 318
- Bumppo, Natty** (Leatherstocking), Cooper's hero, 13-296
- Buna N** (Perbunan), 9-271 B
- Buna S**, 9-281-A, 271-B
- Bunche, Ralph J.**, U. N. mediator, 6-563
- Bundles**, in stems, 2-32
- Bunker Hill, Battle of**, 7-†164
- Bunker Hill Day**, 8-176-B
- Bunker Hill Monument**, 7-\*194
- Bunsen burner**, heat of flame, 1-\*392
- Buntings**, birds, 4-83, 126, †128  
 color plate, 4-\*24
- Bunyan, John**, life and works, main article, 13-†170-71; 6-70  
 portrait, 13-\*170
- Buonarroti, Michelangelo**, *see* Michelangelo Buonarroti
- Buoys**, guideposts of the sea, 10-†227, 229  
 cables attached to, 10-\*105
- Burbage Richard**, Shakespearean actor, 12-330
- Burbank, Luther**, life and work, main article, 13-†416-17; 9-166  
 portrait, 13-\*416
- Burbank potato**, 9-145; 13-417
- Burchell's zebra**, 4-\*351
- Burchfield, Charles**  
 "Railroad Gantry," painting by, 11-\*387
- Burden, beasts of**, *see* Animals, beasts of burden
- Bureaus, government**, *see* names of bureaus, as Children's Bureau
- Burgesses, House of**, Virginia, 7-123, 8-408
- Burgh, Hubert de**, and Arthur of Brittany, 6-\*23
- Burghers**, in Ceylon, 5-387-B
- "Burghers of Calais"**, sculpture by Rodin, 11-\*348, 350
- Burgoyne, John**, English general  
 Battle of Bennington, 12-488, 489  
 surrender at Saratoga, 7-\*168, 170
- Burgundian art**, 11-\*92, †103-5
- Burgundians**  
 Germanic people, 5-268  
 occupy Helvetia, 6-246
- Burgundy** (former dukedom), prov., France  
 added to Austrian domains, 6-260  
 relations with France, 6-174, 175-76
- Burgundy, Dukes of**, rulers of Flanders, 11-217
- "Burial at Ornans"**, painting by Courbet, 11-\*337, 338
- "Burial of Count Orgaz, The"**, painting by El Greco, 11-\*244, 247
- Burial of dead**  
 American Indians, 7-92, \*94, 96  
 Bronze Age, 12-14

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Burial of dead—continued**

- Egyptians, 11-10, 12, 409  
 burial of rulers, 5-12  
 funeral boat, 5-\*60  
 jewelry in tombs, 12-120  
 pottery in tombs, 12-\*53, 54  
*see also* Mummies; Tutankhamon  
 Etruscan, 5-\*189  
 grave rugs used by Mohammedans, 12-148  
 Indian mounds, *see* Indian mound builders  
 Mycenaean portrait masks, 11-\*34  
 Old Stone Age, 5-27, 33  
 Persia, 1-25  
 pottery in graves, 12-47, 50, \*53, 54  
 Red Paint People's past revealed by, 8-149  
 Scandinavian customs, 6-†373, \*376  
 Sumerian customs, 11-24  
*see also* Mummies; Tombs  
**Burial urns**, Etruscan, 5-191  
**Burin**, engraver's instrument, 10-62  
**Burke, Edmund**, biography, main article, 13-201,  
 friend of Dr. Johnson, \*13-\*194, 195  
 opposes Warren Hastings, 5-382  
 quoted, 10-377  
**Burke, Robert O'Hara**, explorer, 5-\*553  
**Burlap**, coarse fabric, 9-285  
**Burleigh, William Cecil**, baron, minister of  
 Queen Elizabeth, 6-54  
**Burleson, Albert J.**, portrait, 12-\*549  
**Burley tobacco**, 8-137  
**Burling of rugs**, 12-\*159  
**Burlington, N. J.**, former capital, 8-251  
**Burlington, Vt.**  
 manufacturing, 8-402  
 temperature, 8-404  
 university, 8-\*400  
**Burlington, Fort**, Iowa, 8-120  
**Burma**, country of Asia, 5-387-B  
*see also* World War II, 6-493  
 animal life  
 birds, 4-183  
 Indian flying fox; bat, 4-275  
 pig-tailed monkey, 4-257  
 python, 3-494  
 tiger, 4-291  
 becomes part of British India, 5-385  
 costume, 9-\*21  
 flag, color plate, 14 following 570, no. 10  
 map, 5-588  
 native carts, 5-\*379; 10-\*145  
 natives, 5-\*378, \*384, 9-\*21  
 products and industries  
 chaulmoogra oil, 9-219-A  
 coal, 9-438  
 ruby mines, 9-431  
 teak, 9-258  
 trade, 10-237  
**Burma, Lower**, Asia, English possession, 5-427  
**Burn**, chess player, game of, 14-490  
**Burne-Jones, Sir Edward**  
 art, 11-\*318, 320  
 design for mosaic work, 12-\*113


**Burne-Jones, Sir Edward—continued**

- stained glass by, 12-77  
 tapestry cartoons made by, 12-144  
**Burney, Charles**, 13-\*194  
**Burning at the stake**  
 heretics, 6-48  
 Indian torture, 7-106  
**Burning glass**, 1-†430, 432,  
 experiments with, 1-115, 116, †209  
**Burnoose**, Mohammedan costume, 5-417  
**Burns, George**, 10-222  
**Burns, Robert**, life and works, main article,  
 13-†209-10  
 birthplace, 13-\*209  
 Carlyle's essay on, 13-236  
 lionized, 6-\*131  
 national anthem of Scotland written by, 6-  
 114, 115  
 portrait, 13-\*209  
**Burns**, treatment for, 2-404  
**Burnside, Ambrose Everett**, defeat at Fredericks-  
 burg, 7-262  
**Burnt River**, Oregon, 8-331  
**Burr, Aaron**, vice president of United States,  
 12-456-F  
 Alexander Hamilton and, 12-508 fol.  
 election of 1800, 7-200  
**Burro**, 10-\*132  
**Burrough, Stephen**, 13-499  
**Burroughs, Bryson**, painting, "Eurydice Bitten  
 by the Snake," 11-\*371  
**Burroughs, Edith**, statue by, 11-\*373  
**Burroughs, John**, life and nature studies, main  
 article, 13-†425-26  
 friendship with Walt Whitman, 13-426  
 portrait, 13-\*425, \*426  
**Burrowing owls**, 4-165, 168  
**Burslem**, England, birthplace of Wedgwood,  
 12-61  
**Burt, Benjamin**, porringer and tankard by,  
 12-\*91  
**Burt, William Austin**, typewriting machine, 10-  
 \*64  
**Burying beetle**, 3-332  
**Bus**, *see* Omnibus  
**Busby, James**, in New Zealand, 5-536  
**Bush babies**, monkeys, 4-\*262, 269  
**Bush master**, snake, 3-489  
**Bush pig**, 4-\*433, 434  
**Bush tit**, bird, 4-62, 63  
**Bushi**, Japanese social class, 5-347, 357  
**Bushido**, Japanese code of chivalry, 5-347  
**Bushman**, African Negroes, 5-445, 475, 570  
 descended from Grimaldi men?, 5-28  
 poisonous arrows, 3-490  
 similarity of art to that of Old Stone Age, 6-  
 317  
**Bushnell, David**, invented a submarine boat,  
 10-308  
**Business**  
 buying and selling, 7-†532-49  
 control under dictatorships, 7-554

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Business**—*continued*  
 coöperative movement, 7-552-54  
 international trade payments, in gold, 7-†510-14  
 power of Congress to regulate commerce, 7-361, 364  
 started from bank loans, 7-520  
 theory and science, *see* Economics  
 trusts, 7-282, 289, 308, 315  
 volume of, in U. S., 1921-33, chart, 7-546  
*see also* Big Business
- Business cycle**, 7-†545-48  
 depression of 1929-35, 7-339, 511, \*546  
 automobile industry affected by, 8-186  
 causes, 7-567  
 effect on farmers, 7-459  
 how to counteract, 7-547  
 Marx's theory, 7-549  
*see also* Panics
- Buskins**, shoes, 12-325
- Bustard**, bird, 4-\*197
- Bustle**, 9-\*15
- Butadiene**, 9-271, 271-A, 271-B
- Butane gas**, 9-271-B, \*456
- Butcher**  
 disappearance of, 9-324  
 functions, 9-323
- Butcher bird** (shrike), 4-†229, \*230
- Butchering**, modern methods, 9-328
- Butler clan**, in Ireland, 6-\*151
- Butte**, Montana, mining, 8-216, 218; 9-\*416
- butter**, main article, 9-†340-44  
 campers' substitutes for, 14-552  
 coloring used in, 9-305  
 melting point, 1-\*392  
 oleomargarine a substitute, 9-†372-73  
 production in U. S., 9-338, 341, 342
- Butter fat**, 9-334, 342
- Butter making**, main article, 9-†340-42
- Buttercup**, 2-\*164
- Butterfish**, 3-\*199  
 care of eggs and young, 3-211  
 jellyfish used for shelter, 3-111
- Butterflies**, main article, 3-†276-84  
 color plates, 3-\*278, \*279  
 distinguished from moths, 3-287  
 egg, 3-\*274  
 humming birds' resemblance to, 4-30  
 migration, 3-281, 282  
 not a true fly, 3-357  
 varieties, 3-276, 282  
 wings, 3-281  
 seen under microscope, 10-\*489
- Butterfly coral**, 3-100
- Butternut**, 9-203
- Butternuts**, nickname, 8-374
- Butterwort**, plant, insects consumed by, 2-62
- Button pearls**, 3-163
- Buttonball** (sycamore), tree, 2-\*274
- Buttonbush**, plant, 2-\*174
- Buttonhole stitch**, sewing, 14-†72
- Buttons**, main article, 9-†50-52
- Buttress**, architecture, 11-\*463, 468
- Butyl rubber**, 9-271-B
- Butyrate**, 10-553
- Butyral**, 10-\*551
- Buying and selling**, main article, 7-†532-49  
 international trade, 7-510-14
- Buzz**, game, 14-155
- Buzzard hawk**, 4-155
- Buzzard State**, nickname for Georgia, 8-84
- Buzzards** (vultures), 4-162  
 appearance in prehistoric period, 3-53  
 Georgia's protection for, 8-84
- Buzzard's Bay**, Mass., 8-176
- By-products**, 10-545-46  
 agricultural  
 beet sugar, 9-127  
 cacao bean, 9-178  
 corn, 9-104  
 cotton, 9-34  
 esparto grass, 9-290  
 fruit, 9-301  
 millet, 9-120  
 peanut, 9-198  
 potatoes, 9-144  
 rice, 9-110  
 rye, 9-119  
 sugar cane; bagasse, 9-293, \*294, 114-15  
 wheat, 9-101-2  
 cellulose, 9-257-58  
 coal, 9-445-47  
 coking, 9-\*446-47  
 fish, 9-370  
 gas, 10-\*391  
 leather, 9-67  
 meat, 9-324, 328  
 petroleum, 9-454  
 silk, 9-44  
 wood, 9-†294
- "By-the-wind sailor"**, hydroed colony, 3-110
- "By Virtue and Arms"**, motto of Mississippi, 8-206-A
- Byblos**, Phoenicia, 5-110, 112
- "Bye, Baby Bunting"**, nursery rhyme, text, color plate, 14-174-F
- Byers, S. H. M.**, words to "Iowa" by, 8-124-A
- Byrd, Richard Evelyn**  
 Antarctic expedition, 13-\*511, †512  
 map, 13-502-B  
 mountains discovered, 1-27  
 Arctic flight, 13-502; 10-320  
 map, 13-502-A  
 portraits, 13-\*511, \*512; 10-\*324
- Byrd, William**, 12-222
- Byrd family**, Virginian planter family, 8-408
- Byrnie**, shirt of mail, 10-352
- Byron, George Gordon, Lord**, life and works,  
 main article, 13-†225-27  
 contemporaries, 6-86  
 portrait, 13-\*226  
 quoted, 5-69
- Byronic**, meaning of term, 13-225

The asterisk (\*) refers to picture and its explanation only. The abelisk (†) refers to illustrated text.

- Byzantine architecture**, 11-†445-49  
capital, 12-\*94
- Byzantine art**, main article, 11-78-81; 5-405  
carving, 11-\*76, \*77; 12-\*94, \*99, \*101  
Irish art influenced by, 11-85  
mosaics, 12-112, 115; 11-79  
Ravenna, 11-80  
St. Mark's Venice, 11-\*78, †446-48; 12-\*111
- Byzantine crafts**  
enameling, 12-†64-66  
furniture, 12-†181  
goldsmithery, 12-\*85, 86, \*87  
jewelry, 12-124, \*125
- Byzantine empire** (Eastern empire), 5-†287-89, †404-12  
continues after fall of Rome, 5-254  
extent, 5-†288, 407
- Byzantine empire—continued**  
map, 5-\*288  
quarrels between Greek and Roman churches, 5-407, 408  
separates from Western Empire, 12-365; 11-73  
wars; disintegration, 5-409
- Byzantium**, capital of Eastern empire  
**architecture**, *see* Byzantine architecture  
art and culture, 5-288, 289; *see also* Byzantine art; Byzantine crafts  
becomes capital of Roman empire, 5-288, 404; 12-365  
founding of, 5-404  
renamed Constantinople, 5-404; 11-445  
star and crescent the symbols of, 14-573  
trade, 5-407  
*see also* Constantinople
- 
- C. C. C.**, *see* Civilian Conservation Corps
- C-Minor Symphony**, by Beethoven, 'cello used in, 12-258
- Cabala**, mystic art, 5-137
- Cabbage**, plant, 9-\*149, 150  
blossoming, 2-222  
breeding, 2-233  
generic name, 2-183  
temperature experiment, 2-\*223  
water content, 2-259
- Cabbage butterfly**, life cycle, 3-†282
- Cabbage family**, 9-148, \*149
- Cabell, James Branch**, author, 13-351  
background of period, 7-335
- Cabeza de Vaca, Alvar Nuñez**, Spanish explorer, in Texas, 8-376
- Cabin**, *see* Log cabin
- Cabinet**, article of furniture, 12-\*187, \*196, 198
- Cabinet**, government, Great Britain, 6-78  
United States, 7-370  
Canada, 7-33-11
- Cabinet Mountains**, Idaho and Montana  
Idaho, 8-92-A
- Cabinet organ**, 12-\*216
- Cabinetmakers and cabinetmaking**  
American, 12-198  
an ancient art, 12-176  
ancient, 12-176, 180  
English, 12-188, 194  
French, 12-190  
"Golden Age of," 12-196  
Italian, 12-186  
medieval, 12-182, 184
- Cabinetmaker's joints**, 14-†27
- Cablegram**, machine for sending, 10-\*96
- Cables**  
bridge, expansion and contraction, 1-478  
"high-tension," 1-†510
- Cables—continued**  
rope, 9-\*286, †288  
telephone, 10-113  
under city streets, 7-397; 10-\*112  
*see also* Cables, submarine
- Cables**, submarine, main article, 10-†101-6  
earliest, 10-102  
effect of water upon electricity in, 10-106  
how made, 10-103, 106  
insulated with gutta-percha, 9-309  
laying and mending, 10-†105  
mileage, 10-106  
photography by, 10-\*94  
stations in Pacific, 8-471, 472  
*see also* Atlantic cable
- Cabot, John**, life and voyages, main article, 13-†471-72  
expedition to America, 13-472; 7-2  
Henry VII's flag planted, 14-573  
Maine coast explored, 8-150  
Newfoundland reached, 7-32
- Cabot, Sebastian**, voyages and explorations, 13-472; 7-2
- Caboto, Giovanni**, *see* Cabot, John
- Cabral, Pedro Alvarez de**, 5-497
- Cabrillo, Juan Rodriguez**, California coast explored by, 8-34  
monument commemorating landing, 7-411
- Cabriolet**, derivation and meaning, 10-22
- Cacao**, tree, description and products, main article, 9-†177-78  
bean pods, 2-\*127  
producing areas, 9-177  
British Honduras, 7-45  
Gold Coast, 5-471  
Ivory Coast, 5-473  
Jamaica, 7-55  
South America, 5-518-B

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Cachalot** (sperm whale), 4-<sup>\*</sup>443, 446  
**"Cachalot, The,"** poem by Pratt, 13-581  
**Cache**, Eskimo storehouse, 7-<sup>\*</sup>35  
**Cactus**, plant, 2-<sup>\*</sup>166, <sup>\*</sup>193, <sup>\*</sup>249  
   Arizona, 8-†20  
   flowers and fruit, 2-†167  
   found in Saguaro National Monument, 8-24-A  
   giant, state flower of Arizona, 8-24-A  
   largest and smallest, 2-252  
   prickles, 2-†203, 206  
   seeds, 2-127  
   spineless, 2-<sup>\*</sup>167; 13-<sup>\*</sup>416, 417  
   stems function like leaves, 2-33  
   uses, 2-206  
**Cactus dahlias**, 2-232  
**Cactus sponge**, sea creature, 3-<sup>\*</sup>84  
**Cactus State**, 8-262-A  
**Cactus wren**, bird, 4-142  
   state bird of Arizona, 8-24-A  
**Caddis fly**, 3-393  
   not a true fly, 3-357  
**Caddis worm**, 3-†392-93  
**Caddo Indians**  
   Nebraska, 8-224  
   Texas, 8-381  
**Cade, Jack**, leads revolt, 6-38  
**Cadenced verse**, 13-348  
**Cadets, West Point**, 7-<sup>\*</sup>479-D  
**Cadillac, Antoine de la Mothe**, founds Detroit, 7-6, 7  
**Cadiz**, Spain  
   founded, 6-318  
   Spanish shipping destroyed by Drake, 12-405  
**Cadmium**, element, symbol, atomic no. and atomic wt., 1-<sup>\*</sup>551  
**Cadmus**, founder of Thebes  
   dragon's teeth sown by, 14-450  
   Greek alphabet originated by, 10-44  
**Ca' d'Oro** (Golden House), Venice, 11-<sup>\*</sup>467  
**Caduceus**, wand of Mercury, 14-411  
**Cadwalader ap Gwynedd**, leads revolt in Wales, 6-139  
**Caenopus**, prehistoric animal, 3-<sup>\*</sup>57  
**Caesar, Augustus**, *see* Augustus (Gaius Julius Caesar Octavianus), first Roman emperor  
**Caesar, Gaius Julius**, *life*, main article, 12-†356-59  
   assassination, 12-<sup>\*</sup>358, 359; 5-225  
   basilica, 5-<sup>\*</sup>231  
   Britain visited, 5-<sup>\*</sup>223, 224; 6-4; 9-419  
   calendar improved, 10-481  
   Cicero opposes, 13-47  
   cipher writing used by, 14-144  
   Cleopatra and, 12-359, 360, <sup>\*</sup>361; 5-226  
   declared a god, 5-236  
   elected consul, 5-224  
   first triumvirate, 12-357; 5-223  
   Gaul, 12-357, 4, 6  
   Germanic tribes checked, 5-270  
   Helvetians defeated, 6-244  
   gem collection, 12-105  
   hears complaints, 5-<sup>\*</sup>225  
**Caesar, Gaius Julius**, *life—continued*  
   hope of finding pearls, 3-162  
   July named for, 10-482  
   knowledge of tides, 1-134  
   military genius and triumphs, 5-223  
   Octavian made heir, 12-362  
   opposed by senate, 5-224  
   Pompey and, 12-357, 358  
   triumph over, 5-224  
   portrait bust, 5-<sup>\*</sup>224; 12-<sup>\*</sup>357  
   rise to power, 5-222; 12-357  
   Rome's greatest general and statesman, 5-224  
   Rubicon, 12-358  
   picture, 12-<sup>\*</sup>356  
   Spain, 5-224  
   temple of, 5-<sup>\*</sup>221  
**Caesar commands**, game, 14-168  
**Caesars, Palace of the**, Rome, 11-<sup>\*</sup>436  
**Caesar's Tower**, 11-<sup>\*</sup>457  
**"Café au lait,"** 9-132  
**Caffeine**, in coffee, 9-132  
**Cagayan**, river of Philippine Islands, 5-570  
**Cagliari**, port of Sardinia, 6-472  
**Cahokia**, Ill., Indian mounds, 8-96  
**Cahutta Range**, mountain chain, Georgia, U. S. A., 8-84  
**Caicos Islands**, West Indies, 7-54  
**Cairo**, Egypt, and vicinity, 5-<sup>\*</sup>73-A  
   average temperature, 5-73 B  
   map, 5-578  
   transportation, 10-<sup>\*</sup>132  
**Cairo**, Ill.  
   temperature, 8-106  
**Caisson disease** (the bends), 1-462  
**Caissons**  
   lighthouse building, 10-227  
   under-water work, 1-366, 367  
**Calais**, France  
   heroism of burghers, 11-<sup>\*</sup>348  
   last English stronghold in France, 6-37, <sup>\*</sup>173, 176  
   lost by England, 6-48  
**"Calais Pier,"** painting by J. M. W. Turner, 11-312, <sup>\*</sup>313  
**Calamian Group**, islands, Philippines, map, 5-595  
**Calamites**, plant, in Devonian geologic period, 3-23  
**Calcasieu River**, La., 8-146  
**Calcium**, element, 1-547  
   symbol, atomic no. and atomic wt., 1-<sup>\*</sup>551  
**Calcium arsenate**, insect killer, 9-33  
**Calcium carbide**, in acetylene gas, 10-392  
**Calcium carbonate**, *see* Lime, carbonate of  
**Calcium salts**  
   bone contains, 2-320, 321  
   effect upon muscles, 2-377  
   saliva contains, 2-355  
   tooth formation, 2-315  
   *see also* Lime, carbonate of  
**Calcium vapor**, seen in sun, 1-110

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Calculating machine**

- at census headquarters, 7-379
- Leibnitz's invention, 13-15
- Pascal's invention, 13-108

**Calculus**, mathematics, 10-425

- discovered by Leibnitz and Newton, 13-15

**Calcutta**, India; capital

- "Black Hole of Calcutta," 5-381
- export products, 10-237
- founded, 5-379
- rainfall and temperature, 5-387-A
- seat of government moved from, 5-386

**Calderón de la Barca**, Pedro, life; dramas,

- main article, 13-79-80
- portrait, 13-79

**Caldron**, bronze, 12-15, \*19**Caldwell**, N. J., birthplace of Grover Cleveland, 8-251**Caledonian Canal**, Scotland, 6-108-B

- map, 6-574

**Calendar**, history of, main article, 10-475-83

- American Indian
  - Aztec, 10-477
  - Dakota Indians, 10-479
  - Mayan, 10-478, \*480, 7-42, 44, 91
- August - 1st day to August, 10-482
- Babylonian, 10-481
- Christ, time reckoned before and after, 10-476
- date, oldest in history, 10-477; 5-49
- date clocks, 10-468
- day, *see* Days
- divided into thirteen months, 10-483
- Druid stone marker, 10-483
- Easter, calculation of date, 7-609
- Egyptian, 10-477, 480, 481, 5-49, 51
- first, 10-480
- Flemish season paintings, 11-190, 192, 203
- Greek, 10-481
  - Olympiad, 5-154; 14-471
- Gregorian, 10-482
- Hebrew, 10-476
- ides and nones, 10-482
- International Date Line, 10-470-72
- Julian, 10-482
- leap year, 10-481, 482
- month, 10-478, 480
  - origin of names, 10-482
- New Year's, 7-606
  - Egyptian, 10-480; 7-606
  - Roman, 10-482, 7-606
- rhyme, 10-482
- Roman, 10-481
- Sabbath, 7-610
- week, 10-482-83
- see also* Seasons; Time

**Calendar stack**, paper machine, 9-279**Calf**, vellum made from skin of, 9-274**Calgary**, Alberta, 7-29-U**Calhoun**, John Caldwell, life, main article, 12-520-22

- Compromise of 1850, 7-247
- death, 7-248

**Calhoun**, John Caldwell, life *continued*

- home, Clemson College, S. C., 12-520
- monument at Charleston, 8-352
- nullification, doctrine of, 12-522; 7-224
- portrait, 12-521
- slavery question, 12-521
- tariff question, 12-521-22
  - compromise worked out, 7-266
- Texas annexation favored, 7-236
- vice-presidency, 12-456 F, 521
  - candidate for, 7-222

**Caliari**, Paolo, *see* Veronese, Paolo**Calico**, cotton fabric, 9-29**Calico bass**, 3-239**Calif**, *see* Caliph**California**, state, U. S., description and history,

- main article, 8-433-41; general data, 8-42-44
- agriculture, 8-35, 38 fol.
- avocado grown in, 9-194
- growing season, 1-211
- see also below* fruit growing
- animal life
  - bighorn mountain sheep, 4-426
  - birds, 4-135-38
    - California quail, 4-143, color plate, \*121
    - California vulture, 4-162
    - emperor goose, 4-120
    - humming birds, 4-141
    - ibises, 4-148
    - phoebe, 4-42
    - white-tailed kite, 4-157
  - gecko; lizard, 3-449
  - squawfish, 3-237
  - salamanders, 3-429
- area, 8-42
- capital and capitol building, 8-33
- charities and correction, list, 8-42-A
- cities - towns, list, 8-39, 43
- climate, 8-42-A, 33
  - cause of dryness, 8-40
  - Japan Current, 1-223
  - reflected in stem of tree, 2-28
  - Santa Ana (a wind), 1-232
- counties, list, 8-43
- Devil's Post Pile, volcanic formation, 7-417, \*418
- education, 8-41
  - institutions for the promotion of the arts, list, 8-42-A
  - institutions of higher learning, list, 8-42-A
- exploration and settlements, 8-34, 36 fol.; 7-232 fol.
- flag, 8-42-B
- fruit growing, 8-40; 9-166
  - citrus fruits, 9-170 fol.
    - orange orchards, 1-207; 9-170
  - date palms, 9-188
  - grapes, 9-167, 168
  - guavas, 9-196
  - mangoes, 9-195
  - olive growing, 9-213
  - orchards saved by ladybirds, 3-336

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**California**, fruit growing--*continued*  
 protective measures  
   against frost, 9-174  
   against infection, 9-170-72  
 giant trees, 2-\*6, 30; 9-\*245, \*250  
 gold rush, 7-239; 8-38  
   effect upon canning, 9-227  
   effect upon clipper ship voyages, 10-173  
   James Marshall's discovery starts '49 rush, 9-393  
   life pictured, 13-333; 9-\*396  
 Golden Gate bridge, 8-\*39  
 history, 8-34-38  
   admitted to Union, 8-38  
   included in Mormon state, 8-393  
 holidays, 8-42-B  
 Indians, 8-36; 7-\*101, \*105  
   reservations, 8-42-B  
 interesting facts, 8-42-B  
 irrigation, 8-40  
   attracts birds to marsh in San Joaquin Valley, 4-\*100  
 library, famous, 10-561  
 location, 8-42  
 map, 8-478  
   on United States map, 7-594  
 missions, 8-36, 37; 11-†499  
 monuments, 8-42-B; 7-411  
   Death Valley, 8-42-B; 7-\*416, 419  
   Muir Woods, 8-42-B; 7-418, 420  
 motto, 8-42-B  
 name, 8-42-B  
 nationalities represented, 8-41  
 New Year's celebration, 8-43; 14-\*579  
 nicknames, 8-42-B  
 parks, 8-42-B; 7-407, \*408  
   Sequoia National Park, 7-\*404  
 physical features, 8-33, 42  
   Klamath Lakes, 4-\*185  
   Mount Shasta's formation, 1-76  
   Mount Whitney, 1-27  
 political facts, 8-42-A  
 products and industries, 8-\*35, 38 fol.  
   beekeeping, 3-\*317  
   cinnabar, 9-417  
   early, 8-36  
   mercury, 9-416  
   mineral deposits in Death Valley, 8-34  
   moving picture industry, 10-\*507, 512  
   natural gas, 9-456  
   oil wells, 9-451  
   pearl fishing, 3-163  
   potash, 10-546  
   poultry raising, 9-359  
   rice growing, 9-108  
   salt, 9-413  
   walnut industry, 9-†202  
 reservations, game and bird, 8-42-B  
 rivers, 8-42  
 San Francisco earthquake, 1-†80  
 Shasta Dam, 7-\*469  
 social life of old Spain, 7-\*234

**California**--*continued*  
 state bird, 8-42-B  
 state flower, 8-42-B  
 state song, 8-42-B  
 trade  
   early, 8-36-37  
   fur trade, 7-231  
   exports, 8-38  
   water supply, 8-41  
   waterways, 8-39  
 "California," origin and meaning of name, 8-42-B  
**California, Gulf of**  
   maps, 7-596, 591  
   region once covered by, 8-42  
**California, University of**, Berkeley, Calif., 8-\*34, 41  
   observatory, 1-\*105  
   stadium, 14-\*517  
**California bank notes**, 8-37  
**California grey whale**, 4-\*443  
**California gull**, Utah's state bird, 8-396 A  
**California Institute of Technology**, Pasadena, Calif., 8-41; telescope, 1-\*189  
 "California or bust," origin of expression, 8-47  
**California poppy**, 8-42 B  
**California quail**, 4 143, color plate, \*152  
**California valley quail**, state bird, 8-42-B  
**California woodpecker**, 4-70  
**California seals**, 4-332  
**Californium**, element, symbol, atomic no. and weight, 1-\*551  
**Caligula, Caius Caesar**, emperor of Rome, character; reign, 5-232  
   entering Rome, 5-\*233  
   never called a god, 5-236  
**Calimala**, guild, 5-310  
**Caliph**, 5-423  
**Caliphate**, Mohammedan government  
   abolished, 5-414, 423  
   beginnings in Arabia, 5-398  
   held by Ottoman Turks, 5-412, 414, 423  
 "Call of the Wild, The," by Jack London, 13-340, 341  
 "Call of Virginia, The," song, 8-418-A  
**Calles, Plutarco**, president of Mexico, 7-87  
**Callicrates**, Greek architect, 11-421  
**Calliope**, muse, 14-411, 432; 12-\*205  
**Callus**, on skin, 2-291  
**Calms**, in meteorology, 1-225  
*Calochortus nuttallii*, flower, 8-396-A  
**Calorie**, unit of heat energy, 1-407; 2-366  
**Calotype**, photographic process, 10-448  
*Calvatia pachyderma*, fungus, 2-\*75  
**Calverley, Charles**, sculptor, 11-\*377  
**Calvert, Cecil**, *see* Baltimore, Cecil Calvert, Lord  
**Calvert, George**, *see* Baltimore, George Calvert, Lord  
**Calvert, Leonard**, governor of Maryland, 8-158  
**Calvert family**, 8-158, 159

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Calvin, John, life and work, main article, 13-**  
 †547-48; 6-252
- Calypso singer, 7-\***65
- Calyx, of flower, 2-†102-3**
- Cam shaft, Diesel engine, 10-\***276
- Cambaluc (now Peiping, China), Kublai Khan's  
 capitol, 5-328**
- Cambio, Arnolfo di, 11-483**  
 contemporaries, 6-299
- Cambium, cell division, 2-10**  
 root, 2-38  
 stem, 2-30, \*33
- Cambodia, kingdom, Indo-China, 5-429, 430,  
 430-B**  
 France in possession of, 5-427
- Cambodians, Asiatic people, 5-429**
- Cambria, name for Wales, 3-9**
- Cambrian Mts., highlands of Wales, 6-108-B**
- Cambrian period, 3-9 10**  
 forms of life in, table, 3-64  
 rock formation, 1-\*40
- Cambridge, Mass., 8-174\***  
 former name, 8-56  
 Harvard University, 8-167
- Cambridge University, England, boat races,  
 14-\***533, 533
- Cambyses, king of Persia, 5-103, \*104**
- Camden, William, 13-163**
- Camden, N. J., factories, 8-245, 247**
- Camden, Battle of, De Kalb's part in, 12-452**
- Camden and Amboy Railroad, 10-191**
- Camden county, N. J., agriculture, 8-245**
- Camelopard, giraffe, 4-403**
- Camelot, seat of King Arthur's court, 14-382**
- Camels, 4-†397-400**  
 anatomy, 4-\*397, 398  
 as burden bearers, 4-†398, 5-\*452; 10-\*132,  
 134  
 caravans, 5-\*58, \*66  
 distance covered by, 4-397  
 drawing and mounting, 14-\*66  
 hair used in rug weaving, 12-156  
 hump, 4-398  
 importance in desert countries, 5-\*395, 444  
 Irak, 5-\*82  
 milk, 9-332  
 origin of word, 5-112  
 stone statue outside Nanking, 5-\*324
- Camel's hair brushes, 9-328**
- Camembert cheese, 9-348**
- Cameos, carved gems, 12-\***101, 105, 124
- Camera, main article, 10-†446-52**  
 astronomers use, 1-188  
 close-ups, 1-433  
 convex lens used, 1-†433  
 eye compared to, 2-†296-98  
 film, 1-436; *see also* Film, photographic  
 iconoscope camera, 10-\*125  
 kinds, 10-452  
 lens, 10-447, †449, \*450  
 moving-picture, 10-503 fol.
- Camera--continued**  
 parts, 1-†436  
 photographs compared with paintings, 11-330  
 speed of electronic, 10-\*446
- Camera obscura, 10-447**
- Cameron, David Young, 10-65**
- Cameron, Richard, leader of Covenanters, 6-128**
- Cameronians, Scotch Covenanters, 6-128**
- Cameroon, or Kamerun, Mount, height, 5-473-A**
- Cameroons, West Africa, 5-473**  
 headdress of young women, 5-\*447  
 Negro life, 5-\*466, \*471, \*473  
 wattle-work huts, 12-\*129
- Camoëns, Luiz de, life and works, 13-80-81**
- Camomile leaf tea, 9-138**
- Camouflage, in war, 1-440**
- Camp Colt, Penn., 12-555-F**
- Camp, lumbering, 9-†246-51**
- Camp, summer, in Maine, 8-155**
- "Campaign, The," by Addison, 13-182**
- Campanile, tower, 11-†454, \*455**  
 Florence cathedral, 11-\*118
- Campaspe, friend of Aristotle, 13-9**
- Campbell, Andrew, rotary press, 10-82**
- Campbell, John, 10-76**
- Campbell-Stokes sunshine recorder, 1-\***274
- Campeche, state, Mexico, map, 7-597**
- Campeche, Gulf of, Mexico, map, 7-597**
- Camphor, 9-\***218, 219  
 used in making celluloid, 10-552
- Camping, main article, 14-†549-60**  
 clothing, 14-550-52  
 fire building, 14-\*553  
 first-aid kit, 2-402  
 food 14-552, 554  
 shelter, 14-556, †557, 558  
 stalking and pathfinding, 14-†561-68  
 water hazards, 14-556
- Campo Formio, Treaty of, 12-424**
- Campobello, Canadian Island, 12-555-B**
- Cams, 10-372**
- Can, C'n, how made, 9-229**
- Can buoys, 10-\***227
- Can Grande, *see* Scala, Can Francisco della**
- "Can Such Things Be?" short story by Ambrose  
 Bierce, 13-346**
- Canaan, 5-118**
- Canaanites, people, 5-118, 120**
- Canada, country, North America, description and  
 history, main article, 7-†1-29; general data,  
 7-33-A-B**  
 agriculture, 7-\*8, \*12, †22, \*28  
 oats grown, 9-119  
 wheat raising, 9-98, 102  
 air lines and air power, 7-29-D, 29-F, 33-I  
 animal life, 7-33-N  
 area, 7-33-A  
 boundary line, 7-29-K  
 canals and waterways, 7-3; 10-274  
 climate, 7-33-A  
 coureurs de bois, 7-6, 11  
 economic depression, 7-29, 29-B

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Canada—continued**

- flag, color plate, 14—following 570, no. 11
- fossils found in rocks, 3-79
- fur trade, 7-3, 5, 6, 7, 19; 10-138
- gold rush, 7-28; 9-393
- government**, main article, 7-33-C-I, 33-A
  - history, early period, 7-5-6, 7
    - English period, 7-11, 14 fol.
    - fight for responsible government, 7-15-18
    - Constitution, 7-14, 17
    - Dominion established, 7-20
    - Canadian citizenship established, 7-29-B
  - ties with Commonwealth, 7-33-D-E
  - Dominion organization, 7-33-F-K
    - function of the king, 7-33-G
    - Parliament, 7-33-G-I
    - Cabinet, 7-33-H-I
  - provincial, 7-33-K
  - local, 7-33-K-L
  - courts, 7-33-I-K
- growing season, 1-211
- history, 7-†1-29, †135-43
  - discovery; earliest explorations, 7-1
  - French exploration and colonization**, 7-†2-7, †135-43
    - famous explorers, 13-†473, †481, †483, †485, 487, †560, †562
    - earliest settlements, 7-3, 4, 5
    - won by England, 7-7, 143
    - Acadians banished, 7-8
  - British rule**, 1763-1867, 7-†10-20
    - during Revolutionary War, 7-11, 12
    - during War of 1812, 7-15, 211
    - separation of Upper and Lower Canada; Civil War, 7-14-18; 13-570 72
    - border settlements, 7-15, 19
    - boundary line controversy, 8-326, 327
    - Pacific settlement, 7-19; 13-565-66
    - Union of 1841, 7-18
    - responsible government granted, 7-18; 13-567, 568, 570, 572
  - Dominion**, 7-†22-29, 29-M
    - set up, 1867; **government**, 7-20
    - Metis rebellions, 7-24; 13-565
    - provinces united, 7-23, 24, 28; 13-570, 572-73
      - loyalty to Great Britain, 7-28
      - Alaskan boundary dispute, 7-28; 8-14
      - disputes with United States, 7-28
      - World War I, 7-28
      - as independent nation, 7-29
      - World War II, 7-29-C-F
      - attitude of Newfoundland toward, 7-33
  - Indians, 7-†98, \*105, 33-I, \*33-F, \*89
  - lend-lease, 7-29-F
  - life of early settlers, 7-11, \*12
  - location, 7-33-A
  - maps, 7-592, 590; arctic regions, 13-502-A
  - minerals, 7-29-F, 33-A, \*29-X; 9-\*422; 1-\*379
  - national parks, 7-\*1, 29-M, 29-Q, 29-V, 29-W, 33-I, \*33-J, 409

**Canada—continued**

- Navy, 7-29-D, \*29-F
- "Our Lady of the Snows," title, 7-1
- physical features, 7-29-K-L, 33-A-B
- political parties, 7-25, 26, 29, 29-B
- population, 7-33-A B
- products and industries, 7-29-F; 1-\*379; 9-\*422
  - asbestos, 7-33-A
  - cheese, 9-347
  - coal and oil, 7-33-A-B, \*29 W; 9-437
  - fisheries, 9-364, \*365, 366, \*367; 7-\*20, \*27, \*29-N
  - lumber, 7-\*13, \*16, \*28
  - maple sugar, 9-124
  - natural resources, 7-33-A-B; 9-389, 403, 426
  - radium, 7-\*29-N
- provinces and territories, 7-23-24, 29 J-X
- railroads, 7-24-25, 28, 29-I, 33-I
- rivers, 7-33-M, \*29-W, \*29-A, \*16; 10-253
- roads, 7-\*29-G; 10-156
- scenery, color plates, 7-\*22, \*23, \*29-J
- social welfare, 7-29-B, 29 G, 33-I, \*33-I
- sports, baseball, 14-508; golf course, 14-\*498, lacrosse, 14-498; skiing, 2 \*417; tobogganing, 14-483; others, 14-519, 521, 524
- trade, 7-29 F, \*22, \*26; 9 102, 329
  - tariff problems, 7-29, 29-B
  - with United States, 7-27, 29-F
- "Canada," packet ship, 10-173
- Canada, Lower**, *see* Quebec
- Canada, Upper**, *see* Ontario
- Canada goose**, 4-120, \*121, \*122, \*1
- Canada Wheat Pool**, 7-29 U
- Canadian art**, 7-29-G, 29-H, color plate, \*29-I
- Canadian Broadcasting Corporation**, 7-33-I
- Canadian Eastern Arctic Patrol**, 7-33-I
- Canadian Fall**, Niagara River, 1-78
- Canadian literature**, 7-29 H
  - biographies, 13-†559-82, *see names of writers in* Table of Contents, Vol. 13
- Canadian Mounted Police**, 7-24, 39; 13-\*569, 570
- Canadian National Railways**, 7-33-I
- Canadian Northern Railway**, 7-28
- Canadian Pacific Railway**, 10-186, 190, 200
  - history, 7-25, 29-V, 33-I; 13-565
- Canadian River**, U. S., 8-386
- Canadian Shield** (pre-Cambrian), 7-29-K
- "**Canadian Wonder Tales**," by C. Macmillan, 7-29-I
- "**Canadian Woodsmen**," by C. Gagnon, 13-\*582
- Canal Zone**, Panama, 7-48, 307, 306
- Canaletto** (Antonio Canale), painting, 11-\*171
- Canals**, main article, 10-†269-74
  - All-American, 8-42
  - Belgium, 6-348
  - Caledonian, Scotland, 6-108-B
  - Canada; Welland Canal, 10-274
  - Cape Cod, 8-170
  - Chicago Drainage Canal, 8-102
  - Lake Champlain to Hudson River, 8-403

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Canals** --continued

## Egypt

between upper and lower Nile, 5-56

from Nile to Red Sea, 10-161, 166

Suez Canal, 10-270, 274

through first cataract of Nile, 5-59, 60

England, 10-274

Bridgewater Canal, 10-186

Europe, 10-274

Florida, 8-72

Germany, 10-274

Grand Canal, China, 10-264

Holland, 6-352, †354, 355-A

Illinois River and Lake Michigan joined by, 8-101

irrigation systems, 10-529, 531

King's Canal, Poland, 10-261

locks, 10-†270, \*271, 274

Louisiana, 8-146

Ludwig Canal, Germany, 10-259

Michigan, 8-186-A

Nicaragua: U. S. buys rights for, 7-48-B

Norway, 6-\*358

of Aztecs, 7-72

Ohio, 8-308

on planet Mars, 1-\*106, 150, \*152, 13-407

possible route through Nicaragua, 7-47

Scotland, map, 6-575

Sweden, 6-407, 10-\*270

United States, 10-†269-74

see also names of canals, as Erie Canal

**Canaries, birds**

wild, 4-59, 83; 6-490

**Canary Islands, Atlantic Ocean, description, 6-490**

banana transport, 10-\*132

caves, 1-86

maps, 6-591; 5-574

origin of name, 10-13

**Canberra, Australia, 5-544, 560-A**

Institute of Anatomy, 5-\*560-11

National Library, 5-560-G

Parliament Building, 5-\*560-A

**Cancer (Crab), constellation, 1-178**

origin of name, 1-204

star maps showing

Jan. and Feb., 1-178-B

March and April, 1-178-D

May and June, 1-178-E, 178-F

Nov. and Dec., 1-178-K

zodiac, 1-\*170

**Cancer, malignant growth, radium used in treatment, 9-426****Cancer, tropic of, imaginary line North of Equator**

calms, 1-225

map, 5-573

solstice, 1-111, 204

**Candia, Sea of, Europe, map, 6-595****"Candida," play by G. Bernard Shaw, 13-271****Candle moulds, 10-†389****Candle power, 10-393****Candlemas Day, see Ground hog's day**

Candles, 10-†389

used as timepiece, 10-†462

Candlesticks, bronze, 12-\*19, \*21

Candlewick, cat-tail spike, 2-145

Candy recipes, 14-83-86

Cane sugar, 9-†113-16

produced in Cuba, 7-57

Canines, teeth, 2-\*314

Canmore, Malcolm, see Malcolm III, king of Scotland

Cannae, Battle of, 5-215, 216; 12-354

Canned heat, alcohol in, 10-547

Cannel coal, 9-444; in West Virginia, 8-435

Cannes, French city, perfume making, 9-302

**Cannibalism**

African Negroes, 5-446, 467

American Indians, 7-\*102

Maoris of New Zealand, 5-532, 536

Pacific islanders, 5-521, 524, 527, 528

Canning, Charles John, earl, viceroy of India, 5-385

Canning industry, main article, 9-†226-31

fish, 9-\*366, \*368, 370

foreign countries, 9-228

fruit, 9-\*226, \*230, 168

milk, 9-338

nuts, 9-†204

United States, 9-227, \*153; 7-343-F

Cannon, 10-358, †360; 7-478

camouflaged, 1-440

cast of bronze, 12-20

how to make toy cannon, 14-†38

war and weapons after invention of, 10-†358-368

Cannon bone, of horse, 4-506, \*507

Canoeing, main article, 14-†509-11

directions, illustrated, 14-†510

Canoes, 14-†509, \*510; 10-138, \*140

Eskimo, 6-†484

Indian, 7-98, \*99, 100

Swiss Lake Dwellers, 5-37

used by early explorers, 7-3, 136

used in Canadian fur trade, 10-†130

Canol project, Canadian oil, 7-29-F, 29-X, \*29-W

Canon, in music, 12-213

Canopic chest, Egyptian, 5-\*10

Canova, Antonio, sculptures, 11-\*290, 291, \*325

Pauline Bonaparte playing part of Venus, 11-\*325

Venus coming from bath, 11-\*290

Cánovas del Castillo, Antonio, 6-334

Cantabrian Mountains, Spain, map, 6-590

Cantaloupe, 9-\*151

Cantata, musical composition, 12-232, 234

Canteens, 1-459; 7-430

Canterbury, England

archbishopric, 6-9

shrine of St. Thomas à Becket, 14-329

Canterbury Bight, New Zealand, map, 5-599

Canterbury Cathedral, 11-\*473, 474

windows, 12-77

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

- Canterbury settlement**, Christchurch, New Zealand, 5-537
- "Canterbury Tales, The,"** by Chaucer, 14-†329-36; 13-\*143, 144  
criticizes abuses and follies, 6-34  
language of, becomes standard English, 10-18  
Landsdowne Manuscript, 13-\*144
- Cantigny, Battle of**, 7-326
- Cantilever bridges**, 10-\*211, 214
- Canton, China**, 10-264  
map, 5-591, M9  
mean annual temperature, 5-336-A
- Canton, Ohio**, iron manufacture, 8-311
- Canute**, *see* Knut the Mighty, king of England
- "Canvas" and "Canvass,"** derivation and changes in meaning of, 10-20
- Canvasback**, duck, color plate, 4-\*120, \*121
- Canyge, Master William**, 13-204
- Canyon de Chelly National Monument**, 8-24
- Canyon**, in physiography, 1-25  
Bryce Canyon, Utah, 1-\*18  
California, 8-42  
Grand Canyon, 7-419; 1-\*46  
how made, 3-3  
Seven Devils Canyon, Idaho, 8-87  
undersea, 1-67  
yellowstone, 1-36
- Caoutchouc**, rubber, 9-261, *see also* Rubber
- Capablanca, José R.**, chess champion, 14-488, 490
- Capanne, Monte**, Elba, 6-474
- Cape**, *see* names of various promontories, as *Good Hope*, *Cape of*, etc.
- Cape Ann**, South Pole region, discovery, 13-506
- Cape Breton**, Nova Scotia, Scotch settlers, 7-14
- Cape Breton Highlands National Park**, 7-29-M
- Cape buffalo**, 4-392, \*394-95
- Cape Cod**, *see* Cod, Cape
- Cape Cod Canal**, 8-170
- Cape Colony**, *see* Cape of Good Hope Province
- Cape Fear River**, N. C., 8-296  
settlement, 8-289
- Cape jumping hares**, 4-380, \*383
- Cape May**, N. J., city  
harbor, 8-247  
resort, 8-246
- Cape Mountains**, South Africa, 1-29
- Cape of Good Hope**, promontory, *see* Good Hope, Cape of
- Cape of Good Hope Province** (Cape Province), formerly Cape Colony, a province of Union of South Africa, description and history, 5-476-81, 482, 484 fol.  
colonized, 5-476  
government, 5-482  
history, 5-476-81, 482, 484 fol.  
Boer War, 5-487  
British rule, 5-479  
Dutch orphan girls sent to, 2-229  
Dutch settlement and rule, 5-477  
Kaffir attacks, 5-481
- Cape pigeons** (petrels), 4-217
- Cape Province**, *see* Cape of Good Hope Province
- Cape Romain Migratory Bird Refuge**, South Carolina, 8-356-A
- Cape to Cairo railroad**, lookout station, 3-\*375
- Cape Town**, city, Cape of Good Hope, Union of So. Africa, *see* Capetown
- Cape Verde Islands**, No. Atlantic Ocean, 6-491  
coral reefs, 1-57  
map, 5-574
- Capella**, star, star maps showing:  
Jan. and Feb., 1-178-A  
July and August, 1-178-G  
May and June, 1-178-E  
Nov. and Dec. 1-178-K  
Sept. and Oct., 1-178-I
- Capen House**, Topsfield, Mass., kitchen, 12-\*196
- Caper**, spice, 9-209
- Capetian dynasty**, France ruled by, 6-169
- Capetown**, capital of Cape of Good Hope Province of Union of South Africa, 5-\*491-A  
asbestos, 5-491-B  
legislature, 5-489  
rainfall and temperature, 5-491-B  
settlement, 5-477  
trade, 10-238
- Capillaries**, minute blood vessels, 2-375  
arteries and veins joined by, 2-279  
bones contain, 2-\*320, \*323, 345  
color plate, 2-frontispiece  
flow of blood through, 2-370, 375, 376  
lungs, 2-334  
reach cells in lungs and liver, 2-346  
service to cells, 2-375
- Capillarity**, physics, 1-\*359, 360  
in wicks, 10-389
- "Capital,"** by Marx and Engels, 7-549
- Capital**, architecture, 11-†418; 12-\*94  
ancient Persian, 11-\*28, 29  
early Christian, 11-†76, \*77  
Ionic, 11-\*416  
Romanesque, 11-†86
- Capital**, economics, defined, 7-537  
and labor, 7-283  
conflict after World War I, 7-333; *see also* Labor  
income from, 7-537  
ownership, 7-549, 550
- Capitalism**  
Marx's theories, 7-549  
Soviet war against, 6-442  
United States  
political opponents, 7-291-92  
relations with Republican party, 7-285  
rise after Civil War, 7-277, 282
- Capitals of states**, *see* subhead capital under names of various states
- Capitan, El**, mountain peak, Calif., 7-409
- Capitan, El**, mountain peak, Texas, 8-377
- Capitol**, building, Washington, D. C., 11-\*511-12; 7-\*285, \*345
- Capitoline Hill**, citadel, Rome, 5-\*203, 205

The asterisk (\*) refers to picture and its explanation only. Theobelisk (†) refers to illustrated text.

- Capri**, island, Italy  
 arches in rocks, 1-<sup>\*</sup>71  
 grottoes, 1-87; 6-476, <sup>\*</sup>480  
**"Caprices of Marianne, The,"** by Alfred de Musset, 13-124  
**Capricorn**, tropic of, imaginary line south of Equator  
 calms, 1-225  
 map, 5-573  
 solstice, 1-111, 204  
**Capricornus** (Goat), constellation, 1-178, 204  
 origin of name, 1-204  
 star maps showing  
   July and August, 1-178-11  
   Nov. and Dec., 1-178-1  
   Sept. and Oct., 1-178-1  
 zodiac, 1-<sup>\*</sup>170  
**Caprifig**, plant, pollination, 2-<sup>†</sup>112  
**Caps**, Swedish political party, 6-405  
**Capsule**, of plant, 2-<sup>\*</sup>83, <sup>\*</sup>84, <sup>\*</sup>213  
**"Captain Reael's Company,"** painting by Frans Hals, 11-261  
**"Captain Singleton,"** by Daniel Defoe, 13-177  
**"Captains Courageous,"** by Rudyard Kipling, 13-269  
**Captains of industry**, origin of term, 7-282  
**Capuchin monkeys**, 4-263  
**Capulin, Mount**, New Mexico, 8-262-A; 7-417  
**Capulin Mountain National Monument**, 8-262-A  
**Capybara**, water hog, 4-378, <sup>†</sup>379  
**Car**, armored, 7-<sup>\*</sup>519  
**Car**, for carrying molten iron, 9-<sup>\*</sup>404  
**Caracal**, wild cat, 4-<sup>\*</sup>284, 296  
**Caracalla**, Roman emperor, portrait bust, 11-<sup>\*</sup>60, 69  
   rebuked by his father, 5-<sup>\*</sup>247  
**Caracalla, baths of**, 12-111  
**Caracas**, city, Venezuela  
   Bolívar entombed at, 5-512  
   rainfall and temperature, 5-518-E  
**Carack**, Flemish merchantman, 10-<sup>\*</sup>165  
**Caractacus**, British chieftain, captive in Rome, 6-<sup>\*</sup>4  
**Carapace**, shield of crustaceans, 3-175, 185  
   turtle, 3-466, 475  
**Carats**  
   gems measured in, 9-431  
   gold weighed in, 9-396  
**Caravaggio, Michelangelo Amerighi da**  
   "The Lute Player," painting, 11-<sup>\*</sup>185  
   urges truth in art, 11-248  
**Caravans**  
   American pioneer, 7-<sup>\*</sup>281  
   Egyptian, 5-<sup>\*</sup>58, <sup>\*</sup>66  
   Irak, 5-<sup>\*</sup>90  
   spice trade, 9-<sup>\*</sup>206  
**Caraway**, herb, 9-209  
   seed, 9-311; 2-<sup>\*</sup>124  
**Carbice**, dry ice, 1-409  
**Carbide**, chemical, 10-548  
**Carbide, calcium**, in acetylene gas, 10-392  
**Carbohydrates**, elements and sources, 2-40  
   use in human body, 2-361  
**Carbolic acid** (phenol), first antiseptic, 13-372  
   burns, treatment for, 2-405  
   made from coal tar, 9-445  
**Carbolic oil** (light creosote), 9-445  
**Carbon**, element, 1-<sup>†</sup>547; 10-551  
   atom, 1-499  
   black dye obtained by burning, 9-306  
   chemical behavior, 1-547  
   coal made of, 9-436, 437  
   diamonds made of, 9-429  
   electrodes, use in, 1-<sup>\*</sup>497  
   how it combines with oxygen, 1-556  
   in dry cell, 1-498  
   petroleum composed of hydrogen and, 9-450  
   steel, 9-401  
   symbol, atomic no., atomic wt., 1-<sup>\*</sup>551  
   telephone, use in, 1-518, <sup>\*</sup>519; 10-113  
**Carbon dioxide**, gas, 1-375  
   air content, 1-375, 219  
   essential to life, 1-375  
   liberated by bacteria, 2-21  
   liquid, 10-418  
   means of producing, 2-45  
   corn yields, 10-547  
   results from burning coal, 1-556  
   physiology  
     arteries dilated by, 2-377  
     blood contains, 2-331, 339, 340, 344, 374, and color plate, 374  
     eliminated by lungs, 2-333, 367  
     nerves affected by, 2-397  
     product of oxidation, 2-334  
     waste product of muscles, 2-379  
   plants  
     absorb and give off, 2-50  
     dormancy of seeds caused by, 2-218  
     effect upon, 2-43  
     used in food making, 2-41 fol.  
   rocks affected by, 1-95  
   uses, 1-375  
     as refrigerant, 1-406, 408, 409; 10-519  
     in fire extinguishing, 1-385  
     in rainmaking, 1-<sup>\*</sup>245  
**Carbon granules**, in telephone, 1-518, <sup>\*</sup>519; 10-113  
**Carbon monoxide**, gas  
   danger in automobile, 2-433  
   results from burning coal, 1-556  
   unites with haemoglobin, 2-339  
**Carbon tetrachloride** (carbona)  
   specific gravity, 1-474  
   use in fire extinguishing, 1-385  
**Carbonari**, Italian secret political society, 6-306  
**Carbonate of lime**, *see* Limestone  
**Carbonic acid gas**, *see* Carbon dioxide  
**Carboniferous period (Age of Coal)**, 3-<sup>†</sup>26-30  
   forest, 3-<sup>\*</sup>26; 1-<sup>†</sup>343  
   forms of life in, table, 3-64  
   fossil plants, 3-<sup>\*</sup>22

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Carboniferous period** —continued  
 rock formation, 1-40  
 sea animals represented in, 3-33  
**Carburetor**, necessary part of an automobile, 10-†283-84  
**Carcassone**, France, 6-202-A  
**Card game**, 14-164  
**Card-throwing game**, 14-157  
**Card tricks**, 14-130-34  
**Cardamon**, spice, 9-209  
**Cardboard**, how made, 9-293  
 how to make things of, 14-†10, †53  
**Cardenas, Lazaro**, Mexican president, 7-87  
**Cardigan Bay**, Wales, map, 6-573  
**Cardinal**, bird, 4-132-33  
 color plate, 4-25  
 Florida cardinal, 4-135  
 graph of song, 4-5  
 Indiana's state bird, 8-116-A  
 member of finch family, 4-83  
 Ohio's state bird, 8-312-B  
 state bird of Delaware, 8-66-A  
 state bird of Illinois, 8-106-A  
**Cardinal grosbeak**, bird, 4-85  
**Carelessness**, cause of accidents, 2-426  
**Cargoes**, loading on ship, 10-248-49  
**Carib Indians**, 7-56, 64, 66  
 original inhabitants of West Indies, 7-54-B  
**Caribbean Sea**  
 buccaneers, 10-\*169, 170  
 island possessions of U. S., 8-474  
 islands  
   **Greater Antilles**, 7-†51-59, 210; general data, 7-60  
   **Lesser Antilles**, 7-†62-66, 210  
   nature of, 1-28  
   **West Indies**, 7-†50-60  
 maps, 7-591; 5-572  
 Spanish Main, a path through, 10-170  
**Cariboo**, Canada, gold strike at, 7-29-V  
**Caribou**, animal, 4-†411, \*421  
 Alaska; importance to Indians, 8-12  
**Carillon** (glockenspiel), musical instrument, 12-258-C  
 Bok carillon ("Singing Tower"), 4-517, \*3  
**Carinthia**, prov., Austria, 6-260  
**Carissimi, Giovanni**, oratorios of, 12-223  
**"Carl"**, meaning, 8-296-A  
**Carleton, Sir Guy**, governor of Canada, 7-12  
**Carlist uprisings in Spain**, 6-333, 334  
**Carlos**, king of Portugal, 6-342  
**Carlos, Don (Balthazar Carlos)**, prince of Spain, portraits by Velasquez, 11-\*250, \*253, 257  
**Carlos, Don (Carlos María José Isadoro de Bourbon)**, claims crown of Spain, 6-333  
**Carlotta**, empress of Mexico, 7-85  
**Carlsbad**, N. Mex.  
 cavern, 1-\*84, 86; 7-409  
**Carlsbad Bird Refuge**, 8-262-A  
**Carlsbad Cavern National Park**, 8-262-A  
*see also* Carlsbad  
**Carlyle, Jane Welsh (Mrs. Thomas Carlyle)**, 13-235  
**Carlyle, Thomas**, life and works, main article, 13-†235-36  
 and Emerson, 13-305  
 portrait, 13-\*236  
**Carman, William Bliss**, life and works, main article, 13-†578-79  
 friendship with George Douglas Roberts, 13-576  
 portrait, 13-\*579  
**"Carmen"**, opera by Georges Bizet, 12-253  
 flute used in, 12-258-A  
**"Carmen"**, tale by Prosper Merimée, 13-131  
**"Carmencita"**, painting by William Chase, 11-\*363  
**Carmona, Antonio Oscar de fragosa**, dictator of Portugal, 6-342  
**Carnarvon, George Edward Stanhope Molyneux Herbert**, earl, 5-485  
 discovery of Tutankhamon's tomb, 5-10  
**Carnarvon Bay**, Wales, map, 6-572  
**Carnatic**, district, India, English and French influence in, 5-381  
**Carnation**, flower, structure, 2-165  
 breeding, 2-230  
 Indiana's state flower, 8-116-A  
 scarlet, 8-312-B  
**Carnauba**, palm, 9-191  
 wax, 2-258  
**Carnegie, Andrew**, creation and use of fortune, main article, 12-†565-66, 7-282  
 portrait, 12-566  
**Carnegie Institute**, Pittsburgh, 12-566  
**Carnegie Institution of Washington**  
 endowed, 12-566  
 telescope erected by, 1-\*189  
**Carnie Alps**, mts., Europe, map, 6-586  
**"Carnival"**, painting by Goya, 11-\*307  
**Carnivores**, flesh-eating animals  
 cat family, 4-285  
 dog family, 4-300  
 fin-footed, 4-331  
 hyenas, 4-308  
 marsupials, 4-464  
 Miocene period, 3-54  
 Oligocene period, 3-52  
**Carniverous plants**, 2-†60-64  
**"Carolana"**, name applied to North Carolina, 8-296-A  
**Carolina chickadee**, North Carolina's state bird, 8-296-A  
**Carolina locust**, 3-346  
**Carolina wren**, 4-21  
 state bird of South Carolina, 8-356-A  
**Carolinas**, states, U. S., 8-351; *see also* North Carolina; South Carolina  
**Caroline**, queen of England, 6-78  
**Caroline Islands**, Pacific Ocean, description, 5-528  
 map, 5-597

The asterisk (\*) refers to picture and its explanation only. Theobelisk (†) refers to illustrated text.

**Caroline Islands** *continued*

- ownership, 5-522, 528
- people, 5-521
- Carolingian art**, 11-†84-86, 88
- Carolingians**, royal house, France ruled by, 5-293; 6-168
- Carolus Magnus*, meaning, 8-296-A
- Caron, Pierre**, *see* Beaumarchais, Pierre Caron de
- Carp**, fish, 3-†227
  - golden carp, 3-†241
- Carpaccio, Vittore**, paintings, 11-†174
  - painting from St. Ursula group, 11-†174
  - painting of boy playing lute, 12-†229
- Carpathian Mountains**, mt. system, Europe, 1-29, 6-368-A
  - maps, 6-586, 594, 605
  - minerals and stones, 6-357
- Carpathian Plain**, Poland, 6-454-B
- Carpeaux, Jean Baptiste**, sculptures, 11-342
  - sculpture of dancing figures, 11-†343
  - sculpture of goddess Flora, 11-†345
- Carpel**, sporophyll of evergreen, 2-95
- Carpentaria, Gulf of**, Australia, map, 5-601
- Carpenter, Frank B.**, painting of Lincoln family, 12-†562
- Carpenter, béc**, 3-300, †301
- Carpentry**, tools, *see* Tools, woodworking
- Carpet beetles**, 3-†331
- Carpetbaggers**, in the South, Reconstruction period, 7-272
- Carpets**, manufacture, 12-†159-61
  - Brussels and Wilton, 12-159
  - cleaning, 12-161
  - how woven, 10-344, †345
  - see also* Rugs
- Carr, Elias, Dr.**, New Jersey state song written by, 8-252-A
- Carracci school of art**, 11-248
- Carranza, Venustiano**, reforms, 7-87
- Carrara, Italy**, marble, 9-380
- Carreño, Theresa**, 12-321
- Carrera, Rafael**, 7-43
- Carriages**
  - earliest, 10-144, †145, †147
  - one-horse shay, 6-†384
  - see also* Wagons
- Carriages, baby**, manufacture, 12-†134
- Carriages, steam**, *see* Steam vehicles
- Carrick bend**, knot, 14-†555
- Carrickmacross, lace**, 12-†169, 172
- Carrier pigeon**, 4-†13
- Carrier shell**, 3-144
- Carrion crows** (vultures), 4-163
- Carroll, Lewis** (Charles Lutwidge Dodgson), life and works, main article, 13-†266-67
- Carrot, vegetable**, 9-150
  - water content, 2-259
- Carrot family**, flower structure; seeds, 2-168
- "Carry Me Back to Ole Virginny"**, song, 8-418-A
- Cars, railway**, 10-†187 fol., 196
- Carson, Kit**, 8-37
- Carson City, Nevada**, 8-233

- Carson Lake or Sink**, Nevada, 8-231, 234-A
- Carson River**, U. S., 8-234-A
- Cart**, *see* Wagons
- Cart horses**, 4-†511, 513
- Cartegena**, Colombia, captured by Drake, 12-405
- Carter, Howard**
  - discovery of Tutankhamon's tomb, 5-†8, 10
  - quoted, 5-8
- Carter Dome**, mountain peak, N. H., 8-242-A
- Carter family**, Virginian planter family, 8-408
- Carter-Moriah Range**, N. H., 8-242-A
- Carteret, George, Sir**, proprietor, 8-250, 252-A
- Cartesians**, philosophers, 13-13
- Carthage**, ancient city, Africa
  - coins of, in the Azores, 6-489
  - description at time of St. Augustine, 13-531, 532
  - destroyed by Romans, 5-†210, 217
  - map, Rome and Carthage, 12-†355
  - people in Spain, 6-318
  - Phoenician settlement, 5-112, 454
  - potter, 12-†42
  - Punic Wars**, 5-†210-17; 12-†353-55
    - capture of Regulus, 12-350
    - use of elephants, 12-353
  - sea power and trade, 5-208, †212
  - war with Etruria, 5-192
  - wealth and luxury, 5-†212
- Carthagena, Spain**, named after old Carthage, 6-319
- Carthaginians**, *see* Carthage
- Carthusian monks**, Zurbaran's paintings of, 11-†252, 258
- Cartier, Jacques**, explorations, main article, 13-†473-74; 7-29-M, 135; 8-151
  - biography by Leacock, 13-580
- Cartilage**, bones made of, 2-320, 323
- Cartons**, paper, 9-293
- Cartoons**, sketched designs
  - for stained glass, 12-†71, †73
  - for tapestry, 12-138, 141, 142, 144
- Cartouches**, Egyptian, 10-†38, †39, 43
- Cartridge**, *see* Shell
- Carts**
  - bullock cart, Siam, 5-†429
  - Burma, 5-†379
  - dog carts, Belgium, 6-†346, 348
  - invention and use of, 10-†143, †144, †145
  - toy, how to make, 14-†38
- Cartwright, Edmund**
  - invents power loom, 10-343
  - responsibility for Industrial Revolution, 6-84
- Carver, John**, governor of Plymouth, 8-166
  - chair, 12-198
- Carver, Jonathan**, and use of name, "Oregon," 8-332
- Carving**, main article, 12-†94-107
  - architectural decoration, 12-†94; 11-†97; 5-†380; 7-†87-A
  - church decoration and ornament, 12-†105, 107
  - cislure, 12-107
  - distinguished from sculpture, 12-96

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Carving**—*continued*

- furniture, 12-†176 fol., \*185, 194  
 gems, 12-†101 fol., 122, \*123  
 how it differs from sculpture, 12-96  
 how to make wooden models, 14-†34  
 inlay, 12-\*99, 102  
 machine, 12-107  
 masks, 12-96, \*98, 100  
 materials carved, 12-98  
   bone, 12-95  
   glass, 12-107  
   horn, 12-95, \*99  
   ivory, *see* Ivory carving  
   jade, 12-\*97, 100  
   lacquer, 12-\*97, 100, †102  
   leather, 12-107  
   rock crystal, 12-100  
   soapstone, 12-100  
   stone, *see* Sculpture; Stone carving  
   wax, 12-107  
   wood, *see* Wood carving  
 screens, 12-\*97  
 seals, 12-103, \*106  
 styles  
   American Indian, 12-†96, \*98; 8-†11  
   Assyrian, 12-\*106; 11-\*26, \*27  
   Austrian, 12-\*101  
   Babylonian, 11-\*22  
   Byzantine, 12-\*94, \*99, \*101; 11-\*76, \*77  
   Chinese, 12-\*97, 98, †100  
   Cretan, 12-102  
   Egyptian, 12-\*94, \*99, 102, \*103; 11-\*17, \*19  
   English; Grinling Gibbons, 12-107, 192  
   Eskimo, 12-95; 7-†39; 8-10, \*14  
   French, 12-\*94, \*101, 107  
   German, 12-\*99; 11-206  
   Gothic, 12-\*101  
   Greek, 12-\*94, 103; 11-†40-42, \*52, \*54  
   Indian (East), 12-102, \*103; 5-\*374, \*380  
   Italian, 12-\*94, \*101, \*181  
   Japanese, 12-\*97, 100, \*102  
   Maori, 5-\*535, \*541  
   Mayan, 7-†90  
   medieval, 12-105, 107  
   Moorish, 12-107  
   Persian, 12-102, \*106; 11-\*27, \*29  
   prehistoric, 4-†510; 5-30, \*31; 11-\*3, 4; 12-95, \*106  
   Renaissance, 12-107  
   Roman, 12-\*94, \*104, 105, 107; 11-\*66, \*67-68  
   Romanesque, 11-†86 fol.  
   Saxon, 12-\*99  
   Scandinavian, 6-373, \*374  
   Syrian, 12-\*99, \*101  
   Tibetan, 12-\*98  
   Turkish, 12-\*99  
 swords, 12-\*99, 100, \*102  
*see also* Engraving  
**Cary, Thomas**, colonists' attempt to elect as governor, 8-288  
**Caryae**, Asia Minor, women of, turned to stone, 11-425

- Caryatids**, columns, of Erechtheum, 11-425  
**Cary's Rebellion**, 8-288  
**Casa Grande National Monument**, 8-24  
**Casa Marquese**, Roman house in Spain, 6-319  
**Casablanca**, Morocco, temperature and precipitation, 5-473-C  
**Casas, Bartolomé de las**, Apostle to the Indians, 5-500  
**Cascade**, physiography, 5-473-A  
**Cascade Range**, mts., U. S., how formed, 1-22  
   climate, 7-343-D  
   map, 7-594  
   Oregon, 8-324, 325, 331  
   tunnel, 10-206  
   Washington, 8-428  
**Case of type**, 10-58  
**Case work**, in social work, 7-444  
**Casein**, compound in milk and cream, 9-347  
   amino acids in, 2-363  
   uses for chemists, 10-547, 552  
**Casement, "General Jack,"** 10-192  
**Casement, Sir Roger**, Irish rebel, 6-161  
**Cash registers**, 10-426  
**Cashel**, Ireland, coronation stone, 6-\*144  
**Cashew nuts**, 9-204  
**Casilear, John W.**, painting by, 11-\*369  
**Casimir, Saint**, portrait, 6-\*446  
**Casimir II, the Just**, king of Poland, serfs aided by, 6-446  
**Casimir III, the Great**, king of Poland, 6-447  
**Casimir IV**, king of Poland, 6-448  
**Casino at Monte Carlo**, 6-467, \*469  
**Casket**, 5-\*10; 12-\*125  
**Caspar**, Wise Man, before infant Christ, 5-\*101  
**Casper**, Wyoming, commerce, 8-452  
**Caspian Sea**, between Europe and Asia, 1-44; 6-443-A  
   elevation, 1-25  
   maps, 5-580; 6-601, 602  
**Cass, Lewis**, American statesman, 8-182  
   exploration in Minnesota, 8-191  
**Cassatt, Mary**, pictures of mothers and children, 11-\*357, 359  
**Cassava plant (manioc)**, 9-211  
   flour made from roots, 9-239  
**Cassiodorus, Marcus Aurelius**, 6-293  
**Cassiopeia**, constellation, 1-178  
   star maps showing  
     Jan. and Feb., 1-178-A  
     July and August, 1-178-G  
     March and April, 1-178-C  
     May and June, 1-178-E  
     Nov. and Dec., 1-178-K  
     Sept. and Oct., 1-178-H  
**Cassiopeia**, in Greek mythology, 14-425  
**Cassiques**, birds, 4-\*181  
**Cassius Longinus, Caius**  
   assassinates Caesar; efforts to restore republic, 5-225  
   opposition to Octavian, 12-362  
**Cassivelaunus**, British chieftain, chariots, 12-6  
**Cassone**, chest, 12-\*183

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Cassowary**, bird, 4-236, \*237, 238  
**Cast iron**, 9-401  
**Castagno, Andrea del**, art style, 11-137  
   painting of Pippo Spano, 11-\*136  
**Cast system**, India, 5-368, 372  
**Castiglione, Baldessare**, Raphael's portrait, 11-168  
**Castile, Blanche of**, *see* Blanche of Castile  
**Castile**, kingdom, Spain, 6-322  
   relations with Portugal, 6-340  
**Castile, or Castilla**, Spain, cave paintings, 11-4  
*Castilleja linariacifolia*, 8-454-A  
**Casting**  
   bronze, 12-18  
     ancient Cretans, 12-13  
     sculpture, 12-18, †20, 22, 24  
   iron, invention, 9-401; 12-3  
   type, 10-53, †55, \*58, 60, 81  
**Castle**, *see* Castles  
**"Castle,"** great Maya temple-pyramid, 7-\*92  
**Castle Peak Lookout**, Holy Cross National Forest, Colo., 2-\*243  
**Castle Pinckney**, national monument in South Carolina, 8-356-A  
**Castlereagh, Robert Stewart**, viscount, 6-91, 95  
**Castles and castle life**, 5-\*302, †304-6; 14-\*377  
   at Kalmar on Baltic, 6-\*305  
   Bavarian, 11-\*481  
   Danish, 6-\*415  
   defenses and outlying domains, 5-\*303, \*304  
   difficulty of heating, 10-†380  
   Finnish, 6-\*456  
   fortification, 10-356  
   furnishings, 5-305; 12-184  
   German, 11-\*488  
   Gothic, 11-476, †477, \*478  
   Japanese, 5-\*353  
   Norman, 11-457  
   Norwegian, 6-386  
   Portuguese, 6-\*341  
   Rhine, 7-\*350; 10-\*361  
   Romanian, 6-\*361  
   stone construction, 9-\*380  
   tennis played in moats of, 14-466  
   unsanitary conditions in, 12-158  
   *see also* Fortresses; Palaces, and names of castles, as Edinburgh Castle; Warwick Castle  
**Castor**, star, star maps showing:  
   Jan. and Feb., 1-178-B  
   March and April, 1-178-D  
   May and June, 1-178-F  
   Nov. and Dec., 1-178-K  
**Castor and Pollux**, temple of, Rome, 5-\*18, \*221; 12-\*94  
**Castor oil**, 9-216, 219  
**Castor-oil plant**, seed-scattering devices, 2-\*213  
**Castro, Cipriano**, 5-517  
**Cat, domestic**, main article, 4-†483-88  
   enemy of birds, 4-485  
   intelligence; training, 4-485  
   love of catnip, 2-175  
**Cat, domestic—continued**  
   savage instincts, 4-286  
   scale drawing, 14-\*64  
   whiskers, 4-485  
**Cat, P. A.**  
   "The Storm," painting by, 11-\*333  
**"Cat and the Fiddle,"** nursery rhyme, text, color plate, 14-174-F  
**Cat bear**, 4-†322  
**Cat family**, 4-285  
   ability to see in the dark, 1-423, 437; 4-484  
   claws, 4-286, 287, 484  
   domestic cats, 4-†483-88; *see also* Cat, domestic  
   love of catnip, 2-175  
   marsupials, 4-463  
   prehistoric  
     Oligocene period, 3-52  
     Pliocene period, 3-57  
   sacred, 4-486  
   senses, 4-286, 484  
   wild members of family, 4-†284-96  
     *see also* names of animals belonging to this family, as Lions; Tigers  
**Cat Nation**, *see* Erie Indians  
**Cat-tails**, plants, 2-\*143, 145  
**Catacombs**, Rome, 5-\*251, \*273; 11-\*75, 440, \*441; 12-\*211  
**Catalyst**, 9-271-B  
**Catapult**, war machine, 10-356, \*357, \*358  
**Cataract**, physiography, 5-473-A  
**Cataracts of the Nile**, 5-48; *see also* Nile River  
**Catawba Indians**  
   North Carolina, 8-288  
   South Carolina, 8-351  
**Catawba River**, *see* Wateree  
**Catbirds**, 4-\*24, †25  
   mimicry, 4-26  
   nest building and breeding, 4-26  
**Catcher**, in baseball, 14-\*503 fol.  
**Catfly**, flower, 2-165  
**Caterpillars**  
   army worm, 3-373  
   butterfly, 3-†277-80, \*282-83  
   color plate, 3-\*270  
   hairy, 3-\*270  
   moth, 3-287 fol.  
   paralyzed by wasps, 3-\*298, 307  
   tent caterpillar, 3-\*367, \*373; 4-76  
**Catesby, Robert**, 6-59  
**Catfish**, 3-242; 9-370  
**Catgut**, used for strings of musical instruments, 12-258  
   first use in surgery, 13-372  
   from sheep, 9-328  
   harp strings of, 12-258-A  
**Cathay**, name for China, 13-445  
   search for route to, 7-112, 113  
   western route discovered, 7-118  
   *see also* China  
**"Cathedral of Old Panama,"** Spanish ruin, 7-\*47  
**Cathedrals**  
   bronze decorations, 12-20

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Cathedrals—continued**

- close, 11-475
- famous windows, 12-77
- Gothic**, 11-†93-90
  - a public enterprise; how built, 11-95
- ironwork, 12-8
- plans, 11-443, 455, \*457
- seat of a bishop; 11-460
- wood carving in, 12-107
- see also* Church architecture; Church decoration and ornament, and names of cathedrals, as Antwerp, cathedral; Notre Dame, cathedral
- Cather, Willa**, novelist, 13-352
  - background of period, 7-335
  - portrait, 13-\*348
- Catherine, Saint, of Alexandria**, life, 13-†526-27
  - paintings of, 11-200
- Catherine I**, empress of Russia, 6-430
- Catherine II, the Great, empress of Russia**, life, 12-†416-17; 6-†432, 433
  - Diderot and, 13-120
  - John Paul Jones in navy of, 12-502
  - Orloff diamond presented to, 9-430
  - partition of Poland, 6-264, 451
- Catherine of Aragon**, queen of England, 12-†391; 6-44, 46
- Catherine wheels**, rose windows, 11-454
- Cathkin Peak**, Union of So. Africa, 5-491-B
- Cathleen ni Hoolihan**, poetic name for Ireland, 6-151
- Cathode ray**, and television, 10-125
- Catholic church**, *see* Roman Catholic church
- Catholic Emancipation Act**, 6-158
- Catholic Society of United Irishmen**, 6-157
- Catholic League**
  - Austria, 6-262
  - Germany, 6-214
  - Switzerland, 6-252
- Catiline, Lucius Sergius**, Roman conspirator, 5-223
  - Cicero exposes plans of, 13-†46
- Catkins**, flower clusters, 2-†158, \*159
- Catnip**, herb, cats fond of, 2-175
- Catnip tea**, 9-138
- "Cato,"** by Addison, 13-182
- Cats**, *see* Cat family
- Catskill Aqueduct**, N. Y., 10-206
- Catskill Mountains**, N. Y., 8-265
  - Ashokan Reservoir, 10-539, †551
  - formation, 8-265; 1-22
  - map, 7-595
- "Catskills, Distant View of the,"** painting by John W. Casilear, 11-\*369
- Cattegat** (Kattegat), North Sea, maps, 5-597, 598
- Cattle**
  - as beasts of burden, 4-394
  - as measure of wealth, 9-333
  - as medium of exchange, 7-503
  - beef, 9-†317, †318, \*325, \*326
    - by-products, 9-328
  - transportation, 9-326

**Cattle, beef—continued**

- ranches, 9-†318, \*319; 7-278, 279
  - Canada, 7-29-U', 29-W
  - Montana, 8-219
  - Texas; struggles among cattle barons, 8-382
    - Wyoming, 8-452
  - weight: cuts, 9-†328
- branding, 9-\*319, 320
- buying and selling, 7-457
- camels, 4-†397-400
- cows that have gone wild, 4-390
- dairying**, 9-†331-38
  - best breeds, 9-†331, fol.; 6-†488
  - food for, 9-334
  - forebears, 9-331, 332
  - herding of, in Switzerland, 9-\*345
  - milking, 9-\*332, †335, \*336
  - Shetland cows, 6-486
  - yield of milk and butter fat, 9-332
- disease producing bacteria, 2-14, \*15
- European centers for raising, 9-332, \*333; 6-162-D
- Holland, 9-332, \*333; 6-\*351
- grains used as fodder for, 9-119, 120, 214
- herbs harmful to, 2-205
- long-horned, 6-\*285
- products and uses
  - butter, 9-†340-42
  - by-products, 9-328
  - cheese, 9-†344-48
  - leather, 9-\*66, \*69, 70
  - meat, 9-†328
  - milk, 9-†331-38
- roving herds, 8-\*46
- vaccination against diseases, 13-368
- white bull sacred to Hindus, 4-394
- wild, 4-†390-400, †415-30
  - on island of Hispaniola, 10-170

**Cattle cars**, 9-326**Cattlemen**, western U. S., 7-278**Cattleya**, orchid, 2-\*151**Catulus, Quintus Lutatius**, Roman consul, 5-213**Caucasia**, or **Caucasus**, region in Soviet Russia,

Europe and Asia

map, 6-601; 5-580

Mount Elbrus, 1-\*26

**Caucasian**, origin of name, 6-368**Caucasian race**, *see* White race**Caucasian rug**, 12-\*146**Caucasians, Dark**, in Africa, 5-445, 458, 462, 472, 473**Caucasus**, mts., Russia, 1-29; 6-368, 443-A

maps, 6-601; 5-580, 582

settled by Hungarians, 6-277

**Caudatus**, defined, 2-184**Cauliflower**, vegetable, 9-148, \*149, 150**Caupolicán**, Indian chieftain, 5-499**Caus, Solomon de**, imprisoned for ideas about steam locomotion, 10-175, \*176**Caustic soda**, 1-558**Cauto River**, Cuba, 7-60

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



- Cavalier State**, nickname for Virginia, 8-418-A  
Virginia, 8-409, 418-A
- Cavaliers**, in English Civil War, 6-64; 12-407  
hats, 9-92
- Cavaliers**, nickname for Virginians, 8-418-A
- Cavalry**, army, 6-\*80  
in modern warfare, 7-477-78
- Cave**, *see* Caves; Caves and grottoes
- Cave dwellers**, *see* Man, prehistoric
- Caveliers**, merchant family of France, 13-485
- "Cavender's House,"** poem by Robinson, 13-349
- Cavendish, Henry**, life and work, 13-†378
- Cavendish Laboratory**, Cambridge, England, 1-\*540
- Caves**  
prehistoric art in, 11-†1-4; 5-\*6, 7, 27 fol.; 6-317  
primitive dwellings, 11-†396  
tombs and temples in, 11-400  
torches used in, 10-388
- Caves and grottoes**, main article, 1-†84-87  
Carlsbad Caverns, New Mexico, 1-\*84, 86; 7-409  
cave of Cumæan Sibyl, 5-207  
Echo River cavern, Ky., 1-\*89, 92  
Fingal's Cave, 6-488  
grottoes of Capri, Italy, 1-87, 6-476, \*480  
national monuments, 7-417
- Caviar**, dressed fish eggs, 3-245
- Cavour, Camillo, count**, fights for Italian independence, 6-308
- Cavy**, animal, 4-\*385
- "Cawdor,"** poem by Robinson Jeffers, 13-354
- Cawnpore**, India, Sepoy Rebellion, 5-384
- Caxton, William**  
at his press, 10-\*21  
English language standardized by, 10-21, 54  
printing introduced into England, 10-†51-52, 54; 6-43  
works printed by, 10-54  
"Canterbury Tales," 13-144  
"The History of Reynard the Fox," 14-324
- Cayman**, reptile, 3-445
- Cayman Islands**, West Indies, description, 7-55  
governed from Jamaica, 7-54
- Cayuga, Lake**, in New York State, 8-265
- Cayuga Indians**, members of the Iroquois League, 8-269
- C. C. C.**, *see* Civilian Conservation Corps
- Cebu**, island, Philippine Islands  
area, 5-570  
Legaspi at, 5-564  
Magellan at, 13-463  
map, 5-595
- Cecil, Robert**, earl of Salisbury, and Queen Elizabeth, 6-54; 12-397
- Cecil, Sir William**, *see* Burleigh, William Cecil, baron
- Cecilia Saint**, 12-\*210
- Cecropia moth**, 3-\*291  
cocoon and pupa, 3-\*289
- Cecrops**, king of Attica, 5-152
- "Cedant Arma Togae,"** motto of Wyoming, 8-454-A
- Cedar**, wood, 9-258  
baskets from bark, 12-\*135  
canoes made of, 14-509  
cigar boxes made of, 7-60
- Cedar apples**, plant disease, 2-141
- Cedar Breaks National Monument**, 8-396-A
- Cedar Creek, Battle of**, 7-260
- Cedar Rapids**, Iowa, rolled oats, 8-123
- Cedar waxwings**, birds, 4-\*28, \*29
- "Ceilings,"** limits set on prices, 7-563; price, 7-508, 343-B
- Celebes**, island, Malay archipelago, 5-529-B  
in East Indies, 5-523  
map, 5-596  
native costume, 5-\*525  
once joined to mainland, 3-61  
physical features, 5-529-B
- Celebes Sea**, East Indies, map, 5-596
- "Celebrated Jumping Frog of Calaveras County, The"** by Mark Twain, 13-330
- Celery**, plant, 9-†150  
conditions affecting flowering time, 2-221  
effect of different temperatures on, 2-\*221  
New Jersey, 8-\*248
- Celery seed**, 9-311
- Celesta**, musical instrument, 12-258-C
- "Celestial Mechanics,"** by Laplace, 13-406
- Celestial or Echo Organ**, 12-258-D
- Cell**, *see* Cells
- Cell, electric**, *see* Electric cell
- Cell division**, plant, 2-\*9, 10  
algae, 2-67
- Cell sap**, 2-9
- Cell theory**, 2-280
- Cell wall**, plant, 2-†7
- Cella of Greek temple**, 11-417
- Cellini, Benvenuto**  
bronze work, 12-\*20, 22  
Ganymede statue, 11-\*169  
goldsmithery, 12-\*79, 88  
Perseus statue, 12-\*20
- 'Cello**, *see* Violoncello
- Cellophane**, how made, 9-293, 294  
how to make colored window of, 12-73  
wood pulp used in manufacture, 10-547
- Cells**, animal, classification; functions, 2-360  
air cells of lungs, 2-334, \*336, \*337, 338  
amoeba, structure, 2-†21, \*280  
bone-forming, 2-\*320, \*323, 324  
of teeth, 2-315  
cartilage, 2-323  
cell theory, 2-280  
discovery, 2-279  
division, 2-\*279  
egg cell of rabbit, 13-\*361  
fuel for; oxidation, 2-360, 366  
hair, 2-290  
metabolism, 2-361  
muscle, 2-327, 361  
organism built of, 2-280

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Cells—continued**

- retina, 2-298
- protoplasm, 2-279
- sensory, 2-307, 308, 309, 305
- served by capillaries, 2-375
- served by red blood corpuscles, 2-344
- skin, 2-287
- structure, 2-\*279
- Vorticella, 2-\*280

**Cells, plant, structure and division, main article, 2-†6-10, †279**

- egg cells, 2-\*83, 84
- of leaf, 2-†26

**Celluloid, 9-294**

- a synthetic plastic, 10-552
- camphor used in manufacture, 9-219
- film made of, 10-503

**Cellulose, chemical, chemical composition, 9-86**

- how obtained; products, 9-293, \*294
- in plants, 2-40
- in rayon manufacture, 9-84, 86
- use in chemistry, 10-552-53

**Cellulose xanthate, 9-84, 86****Celsius, Anders, Swedish astronomer, inventor of centigrade thermometer, 6-407****Celsius, Olaf, patron of Linnaeus, 13-411****Celtiberians, people, 6-318****Celtic art, 11-†83-84****Celtic cross, 11-†83****Celtic language, 5-270****Celtic race, *see* Alpine race****Celts, people, civilization; migrations, 5-267, 268, 271**

- Austria, 6-258
- Britain, 6-4
- enameling, 12-64
- France, 6-165
  - adopt Latin tongue, 5-270
- Iceland, 6-418
- Icelanders' contacts with, 6-418, 419
- Ireland, 6-143, 144
- ironwork, 12-4, 8
- rings used for money, 12-117
- Scotland, 6-111
- Spain, 6-318
- stories of Arthur and his knights, 14-377
- Switzerland, 6-244
- traces in modern Europe, 6-162-D
- Wales, 6-136, 137

*see also* Britons

**Cement, building, manufacture of, 9-\*383, 384**

- chemistry aids progress, 10-545
- see also* Concrete

**Cement, made by insects, 3-302, †303, \*392****Cement, of teeth, 2-\*313, 315****Cemeteries**

- national, U. S., 7-414
  - Gettysburg, Penn., 8-341
  - Virginia, 8-418-A
  - Red Paint People, 8-149
  - soldier, in France, 14-\*575

**Cemetery Ridge, Battle of Gettysburg, 7-263****"Cenci," by Shelly, 13-229****Cennefalled, first to write Irish law, 6-146****Cennini, Bernardo, printing press, 10-\*51****Cenomanni, meaning, 8-156-A****Cenozoic (New Life) era, general characteristics, 3-6**

- forms of life in, table, 3-64

- fossilized insects, 3-\*18

**Quaternary period, 3-†59 63; 1-40**

- strata and fossils, color plate 3-frontispiece

**Tertiary period, 3-†46-57; 1-40****Censors, Roman, 5-201****Census, Domesday Book the first in England, 6-20****Census, Bureau of, U. S., work of, 7-†379, 381****Centaur, constellation, 1-171****"Centaur Killing a Tiger," Greek painting, 11-50****Centaur, mythology**

- defeated by Theseus, 14-\*447, 448
- in Parthenon frieze, 11-423

**Centennial Exposition, Philadelphia, Bell's telephone exhibit, 10-111****Centennial State, 8-52-B****Center Party in Germany, 6-232****Centerframe, Diesel engine, 10-\*276****Centerville, Delaware, highest point in state, 8-66-A****Centigrade thermometer, 1-†214, \*392****Centiliter, unit of measure, 10-377****Centipedes, "hundred-footers," 3-†264 67****Central America, description and history, main article, 7-†41-48**

- American Marines in, 5-518

**animal life**

- birds, 4-177 fol.
  - bittern, 4-105
  - boat-billed heron, 4-\*144
  - humming bird, 4-30, 141, 177
  - kite, 4-157
  - migration to United States, 4-132
  - parrot family, 4-188, 192
  - rose-breasted grosbeak, 4-84
  - sapsucker, 4-73
  - scissortail, 4-138
  - swallow, 4-36
  - thrush, 4-53
  - warbler, 4-58

**crocodiles, 3-443****jaguar, 4-292****kinkajou, 4-324****lizards, 3-449, 452, 453, 456, 458****monkeys, 4-262****opossums, 4-469****raccoons, 4-323****snakes, 3-496****tapirs, 4-348****toads, 3-426****"toothless" animals, 4-452****turtles, 3-475****archaeology, 5-19; 7-\*42, 44****climate, 7-33-M****Indians, 7-90**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

**Central America--continued**

- languages, 7-43
- maps, 7-598, 591
- political divisions, 7-41, 42
  - list, 7-33-N
- physical features, 7-41
- products and industries, 7-41, 42
  - mahogany, 9-258
  - minerals, 7-33-N
- Spanish exploration and conquest, 7-116, 117, 119
- Spanish rule, 7-42
- Central Basin**, depression, Tennessee, 8-373
- Central Canada**, 7-29-O-R, 33-A; 33-B
- Central City**, Col., 8-52-A
- Central City Play Festival**, 8-52-A
- Central Committee**, governmental body, Russia, 6-443-B
- Central heating systems**, 10-†382-85
- Central Lowland**, Wis., 8-446
- Central Mount Stuart**, Australia, 5-553
- Central Pacific Railroad** (transcontinental line),
  - construction of, 10-†190-92, †194
  - ceremony of laying last rails, 10-194, \*196
- Central Powers**, World War I, 7-318
- Central Range**, mountain chain, Persia, 5-106
- Central State**, 8-132
- Central time**, 10-473
- Central Valley of California**, 8-42
- Central Valley Water Conservation Project**, 8-43
- Centralia**, Ill., record high temperature, 8-106
- Centrifugal force**, 1-†310-12, \*313
  - action on automobile rounding curve, 2-439, 440
  - moon, 1-122, 136
  - universe, 1-6, 13, †15, 16
- Centrifugal pump**, 1-465
- Centrosome of cell**, 2-\*279
- Centrospermae**, plants, 2-160
- Century of Progress Exposition**, Chicago, 8-104
  - opened by light from star Arcturus, 1-†413
- Century plant**, blossoming of, 2-262, \*249
- Century Theater**, New York City, decorations for "The Miracle," 12-334
- Cephalopods**, mollusks, 3-171
  - Ordovician period, 3-15
- Cephalus and Aurora**, in Greek myth, 14-434
- Cepheus**, constellation, 14-425
  - star maps showing
    - Jan. and Feb., 1-178-A
    - July and August, 1-178-G
    - March and April, 1-178-C
    - May and June, 1-178-E
    - Nov. and Dec., 1-178-K
    - Sept. and Oct., 1-178-H
- Ceramic industries**, *see* Pottery; Tiles
- Ceramics**, New York State College of, 12-61
- Ceratosaurus**, prehistoric lizard, 3-41
- Cerberus**, mythological monster
  - captured by Hercules, 14-430
  - guards entrance to Hades, 14-407

- Cereals**, main article, 9-†118-20
  - derived from grasses, 2-177
  - Indian corn, 9-†104-6
  - Michigan's industry, 8-183
  - wheat, 9-†97-102
- Cerebellum**, brain, structure; functions, 2-\*384, †385-86
- Cerebral hemispheres** (cerebrum), brain structure; functions, 2-\*384, \*385, 386
- Ceres** (Demeter), goddess of fertility, 14-407
  - and Persephone, 14-†416
  - influence over harvest, 9-118
- Ceres**, planetoid, 1-152
- Cereus giganteus*, 8-24-A
- Cerium**, symbol, atomic no. and wt., element, 1-\*551
- Certificate**, stock, 7-525
- Cervantes Saavedra, Miguel de**, life and works,
  - main article, 13-†73-77; portrait, 13-\*75
- Cervera y Topete, Pascual**, Count of Jerez, commands Spanish fleet at Santiago, 7-296
- Cervical nerves**, 2-\*393
- Cervin, Mont**, *see* Matterhorn
- Cesium**, element, symbol, atomic no. and wt., 1-\*551
- Ceuta**, Morocco, taken by Portuguese, 6-340
- Ceylon**, British dominion, Indian Ocean, general
  - data, 5-387-B
  - animal life
    - bats, 4-275
    - birds; parakeets, 4-192
    - crocodiles, 3-441
    - deer, 4-\*402
    - flying squirrels, 4-368
    - monitor lizards, 3-\*463
    - monkeys, 4-258
    - slow loris, 4-269
  - area, 5-387-B
  - climate, 5-387-B
  - costume, 5-\*378
  - crown colony, 6-558
  - ferry boat, 10-\*140
  - footwear, 9-\*54
  - government, 5-387-B
  - headaddresses, 9-\*93
  - maps, 5-587, 580
  - Mohammedanism, 5-387-B
  - people, 5-387-B
  - physical features, 5-387-B
  - products and industries, 5-387-B
    - cinnamon, 9-209
    - coffee, 9-130
    - ebony, 9-258
    - rubber, 9-266
    - sapphire mines, 9-433
    - tea growing, 9-\*137, \*139
  - rivers, 5-387-B
- Ceylonese monitor**, lizard, 3-\*463
- Cézanne, Paul**, life and art, 11-†381-84
  - "Man with a Blue Cap," painting, 11-\*383
  - painting of still life, 11-\*384
- Chacma baboon**, 4-†259

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Chaco Canyon**, New Mexico, 8-262-A  
**Chad**, colony, Africa, 5-473  
**Chad, Lake**, Africa, 5-473-A  
 map, 5-575  
**Chadwick, James**, scientist, 1-558-D  
**Chaeronea, Battle of**, 5-178  
**Chaetodon**, fish, 3-\*134  
**Chaffinch**, bird, 4-†172  
**Chain broadcasting**, 10-121  
**Chain limpet**, mollusk, 3-145  
**Chain mail armor**, 10-352, \*354  
**Chain stores**, 7-538  
**Chairs**  
 American, 12-\*195-97, †198  
 ancient, 12-176 fol.  
 covered, used in Macassar, 5-\*427  
 division of labor in assembling, 7-\*498  
 English, 12-†182, \*191, 194  
 French, 12-\*189, \*190  
 medieval, 12-182, 184, 185  
 modernistic, 12-\*174, \*175  
 most famous, 12-181  
 Renaissance, 12-\*183, \*187  
 sedan chairs, 10-130, \*132, \*134; 5-\*427  
 throne chairs, 12-178, †181, †182, 185  
**Chaka**, Zulu chief, 5-481  
**Chaldea, ancient country, Asia**, history, main  
 article, 5-94-97  
 art, 11-28  
 conquest of Assyria, 5-92  
 map, 5-\*88  
 modern life in land of, 5-\*94  
 people, 5-97  
 knowledge of glazing, 12-55  
 thought earth flat, 1-101  
 rule of Babylon, 5-95  
 Ziggurat at Ur, 11-24, 404, \*405; 5-\*11, 14  
*see also* Assyro-Babylonian entries and Baby-  
 lonia  
**Chaliapin, Feodor Ivanovich**, 12-255  
**Chalices**, gold and silver, 12-\*84, \*85  
**Chalk**, mineral, formed from Foraminifera  
 skeletons, 3-14, 44, 79; 1-51  
 geologic eras found in: diagram, 1-\*40  
**Chalk cliffs**, 3-14, 79  
**"Challenger," ship**, scientific voyage, 1-67  
**Chalybes**, people, of Asia Minor, ironwork, 12-2  
**Chamber music**, 12-234, 243, 258  
**"Chambered Nautilus, The," by Oliver Wen-**  
**dell Holmes**, 13-309  
**Chamberlain, C. H.**, song by, 8-106-A  
**Chamberlain, Neville**, British premier, 6-108  
 portrait, 6-\*502  
**Chambre, John**, portrait by Holbein, 11-\*213  
**Chameleon**, lizard, 3-455, †456, 461  
**Chamisso Island Bird Refuge**, 8-16-B  
**Chamois**, animal, 4-†424  
**Chamois**, leather, sources, 9-70  
**Chamorro**s, people, in Guam, 8-465  
**Champagne Castle**, mountain, Union of So.  
 Africa, 5-491-B  
**"Champlain," song**, 8-404  
**Champlain, Samuel de**, life, main article, 13-  
 †481-82  
 explorations, 13-477; 7-3, 136  
 Maine coast explored, 8-151  
 Mt. Desert Island discovered and named,  
 8-156  
 map made by, 8-404  
 portrait, 13-\*481  
 relations with Iroquois, importance of, 7-†136,  
 137  
 statue, 7-\*2  
**Champlain, Lake**, between N. Y. and Vermont,  
 8-283, 403, 404  
 discovery, 13-482  
 drained by Coosa River, 8-2  
 Macdonough's victory on, 7-211  
**Champlevé, enamel**, 12-63, †65-66  
**Champollion, Jean François**, 5-104  
**Chancel**, development from apse, 11-443  
**Chancellorsville, Battle of**, 12-539  
**Chandelier**, cut-glass, 12-\*34, 35  
**Chandragupta**, Indian king, 5-370  
**Chang Chih-ho**, Chinese philosopher, 5-325  
**Chang Sun**, Chinese empress, 5-325  
**Change Alley**, London, 6-\*76  
**Chanin Building**, New York, 11-\*517-18  
**Channel Islands**, English Channel, 6-108-B, 488  
 famous breeds of cows, 6-†488  
 map, 6-578; *see also* index World War II, 6-493  
**Channel Islands National Monument**, Califor-  
 nia, 8-42-B  
**Channing, William Ellery**, abolitionist, 7-236  
**"Chanson de Roland," French epic**, retold, 14-  
 †337-42  
 place in French literature, 6-169  
**"Chansons de geste," French epic poems**, 14-337  
**"Chantecler," by Rostand**, 13-137  
**Chantilly lace**, 12-172  
**Chants, Gregorian**, 12-212  
**Chants of Navajo Indians**, 7-97  
**Chanute, Octave**, glider of, 10-\*316, 317  
**Chanute, Kansas**, no taxes, 8-132  
**Chaparral**, 7-343-E  
**Chaparral cock**, bird, 4-\*141, †142  
**"Chapin, Deacon Samuel," statue by St.**  
**Gaudens**, 11-\*376  
**Chapman, Doctor**, cited, 4-134  
**Chapman, Carlton T.**, 4-134  
 "Waiting for a Breeze," painting, 11-\*371  
**Chapping**, cause of, 2-289  
**Chapultepec, Battle of**, 7-\*237  
**Char-à-banc**, motor bus, 10-281  
**Character**, Zeno's conception, 13-12  
**Chardin, Jean Baptiste**, paintings, 11-†283  
 "A Young Woman Knitting," painting, 11-  
 \*283  
**Chardonnet, Hilaire de**, Count, process for  
 making "silk," 9-83  
**Chares**, Colossus of Rhodes made by, 6-478  
**Charge accounts**, 7-518

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**"Charge of the Light Brigade,"** by Tennyson, 13-†249

quoted, 6-†98

**Charges, electric,** positive and negative, 1-495

**Charing Cross,** London, 6-24

**Chariot racing,** Roman, 5-\*236

**Charioteer,** constellation, star maps showing:

Jan. and Feb., 1-178-A, 178-B

July and August, 1-178-G

March and April, 1-178-C

May and June, 1-178-E

Nov. and Dec., 1-178-K

Sept. and Oct., 1-178-J

**"Charioteer of Delphi,"** statue, 11-\*39, 41

**Chariots,** 10-†144

Etruscan, 5-\*189

iron war chariots, 12-2, 6

**Charity and philanthropy,** *see* Social welfare work

**Charlemagne (Charles the Great),** emperor, life, main article, 12-†368-70

aids commerce and agriculture, 12-370

and Pope Leo III, 12-\*368, 369

and Wittekind, 5-287

Byzantine furnishings sought by, 12-66, 86, 182

cathedral of Aix-la-Chapelle erected by, 11-\*46;

crowned emperor by pope, 6-294

empire; Europe in time of, map, 5-\*265

encourages art and learning, 11-84

founder of Holy Roman Empire, 6-168, 258

in Song of Roland, 14-†337-42

laws safeguarding armor, 10-352

name in Latin, 8-296-A

organizes East Mark, or Austria, 6-258

reign, 5-†292; 6-168

Saxons subdued by, 6-\*166

statues, 11-\*85, 14-\*337

unites all Germans under his rule, 6-207

use of Byzantine jewelry, 12-124

wars, 12-369

**"Charles,"** derivation of name, 8-296-A

**Charles II, the Bald,** Holy Roman emperor, 6-169

**Charles III, the Fat,** Holy Roman emperor, 6-168, 169

**Charles V,** Holy Roman Emperor (I, king of Spain), 6-261, 325-27

aided by Fuggers, 6-\*212

artists employed by, 11-202

Catholic nations led by, 6-354

enters Antwerp, 6-\*326

Erasmus and, 13-\*82

"Field of the Cloth of Gold," 6-\*44

Francis I and, 6-176

Henry VIII and, 12-392

king of Spain, 6-261, 325, 329

Luther tried by, at Diet of Worms, 13-543

painting by Titian, 11-180

Pizarro and, 7-\*117

Reformation, 6-212

relations with Hungary, 6-284

Saint Francis Borgia and, 6-327

**Charles VI,** Holy Roman emperor, reign, 6-264

**Charles IV,** emperor of Austria, efforts to save throne, 6-275, 290

**Charles I,** king of England, reign, 6-62

and Scottish church, 6-126

and William Harvey, 13-\*360, 361

costume, 9-\*20

execution, 6-66, \*67, 127; 12-409

grants Massachusetts charter, 7-125

Maryland granted to Lord Baltimore, 8-158

Maryland named by, 8-162-B

North Carolina grant, 8-296-A

portraits, 11-\*216, 228

of royal family, 6-\*61; 11-\*225-26, 228

relations with Parliament, 12-407-9

Rubens as ambassador to, 11-225, 226

rule of Ireland, 6-154

trial, 6-\*66

Van Dyck at court of, 11-228

**Charles II,** king of England, reign, 6-70

arms of Virginia put on shield, 8-406

Bombay acquired by marriage, 5-378

charter: Hudson's Bay Company, 10-138

court, 13-172

fashions in clothing set by, 9-†18

landing in Dover, 6-\*69

New Jersey section given to brother, 8-250

palaces furnished by, 12-188

Pennsylvania named by, 8-342

portrait, 6-\*72

Portuguese wife, 5-378

proclaimed king in Scotland, 6-68

relations with Scotland, 6-127

rule in Ireland, 6-155

South Carolina granted to favorites, 8-330

theaters reopened by, 12-331

Virginia made a dominion by, 7-123

William Penn granted land, 7-130; 12-461

yachting introduced into England by, 14-528

**Charles III, the Simple,** king of France, 6-168, 169

gives Normandy to Vikings, 6-375

**Charles V,** king of France, reign, 6-174

patron of art, 11-103

statue, 11-\*92, 103

tennis played by, 14-466

**Charles VI, the Well-beloved,** king of France, reign, 6-\*170, 174

**Charles VII,** king of France, reign, 6-175-76

Joan of Arc wins crown for, 12-†386-90

**Charles VIII,** king of France, reign, 6-176

Alexander VI forces to surrender, 5-137

crowned king of Naples, 6-302

**Charles IX,** king of France, reign, 6-176

costume, 9-\*11

**Charles X,** king of France, 6-†198

**Charles I** (Charles Robert of Anjou), king of Hungary, reign, 6-280

**Charles VI,** king of Hungary, reign, 6-284

**Charles I,** king of Spain, *see* Charles V, Holy Roman Emperor

**Charles II,** king of Spain, 6-329; 11-258

**Charles III,** king of Spain, reign, 6-331

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Charles IV**, king of Spain, 6-331, 332  
and family, painted by Goya, 11-308
- Charles VIII** (Karl Knutsson), king of Sweden, 6-397
- Charles IX**, king of Sweden, reign, 6-400
- Charles X, Gustavus**, king of Sweden, wars, reign, 6-401
- Charles XI**, king of Sweden, reign, 6-402
- Charles XII**, king of Sweden, 6-†401, 402, 405  
invades Norway, 6-388  
wars and conquests, 6-402
- Charles XIII**, king of Sweden, 6-407
- Charles XIV, John**, king of Sweden and Norway, 6-390, 407
- Charles XV**, king of Sweden and Norway, 6-407
- Charles**, Danish prince, crowned Haakon VII of Norway, 6-390
- Charles V, Leopold**, duke of Lorraine, leads Imperial army against Turks, 6-\*281, 282
- Charles Albert**, king of Piedmont, 6-308
- Charles Edward Stuart** (the Young Pretender)  
escape after Culloden, 8-290  
portrait, 6-\*125  
seeks English crown, 6-75, 125, 130
- Charles Martel** (Charles the Hammer) Frankish ruler  
mayor of the palace, 6-167  
Moors defeated by, 5-292; 6-320
- Charles of Anjou**, king of Naples and Sicily, becomes king of Italy, 6-298
- Charles Robert of Anjou**, *see* Charles I, king of Hungary
- Charles the Bold**, duke of Burgundy and Louis XI, 6-176  
Maximilian I marries heiress of, 6-260  
Swiss wars, 6-247, 249, 250
- Charles the Great**, *see* Charlemagne
- Charles the Hammer**, *see* Charles Martel
- Charles, Jacques Alexander César**, balloon made by, 10-\*319
- Charles, Cape**, Labrador, Longitude, 7-33-M
- Charles, Fort, S. C.**, early Huguenot settlement, 8-349
- Charles Mound**, Ill., hill, elevation, 8-106
- Charles River**, Mass., harvesting ice on, 10-516
- Charles Sheldon Antelope Refuge**, 8-234-B
- Charles's Wain**, star group, *see* Big Dipper
- Charleston, S. C.**, 8-349, 350, 352  
defended by Pulaski Legion, 12-455  
industries, 8-355  
monument to Calhoun, 8-\*352  
shipping pier, 8-\*353  
taken by British, 8-352  
temperature, 8-356
- Charlestown, W. Va.**, 8-430  
capitol building, 8-\*430  
industries, 8-436
- "**Charleston**," U. S. S., Guam taken by, 8-464
- Charleston Navy Yard**, Boston, Mass., 8-174
- Charlotte**, queen of England, portrait by Lawrence, 11-\*302
- Charlotte, N. C.**, 8-290, 292, 294, 296
- Charlotte Amalie**, capital, St. Thomas Island, 8-467, \*466
- "**Charlotte Dundas**," steamboat, 10-220
- Charlottetown**, P. E. I., Canada, 7-29-M, \*33-D
- Charms**, gems used as, 12-103  
Egyptian, 5-63
- Charon**, mythology, 14-407
- Charpentier**, French publisher, Renoir's painting of family of, 11-381
- Charter Oak**, Conn., 7-126; 8-57; 7-\*128
- Charter Oath**, Japan, 5-363
- Charter vessels**, 10-232
- Charters**  
city, 7-391  
corporation, 7-524  
given to medieval towns, 5-311
- Chartism in England**, 6-95
- Chartres Cathedral**, 11-95, 460, \*461  
sculptures and carvings, 11-†93-97; 12-\*105  
stained glass window, 11-\*101, \*464
- Charybdis**, mythological monster, 14-420
- Chase, Roscoe L., Mrs.**, song by, 8-347
- Chase, William**, artist  
"Carmencita," painting, 11-\*363
- Chase Lake Bird Refuge**, North Dakota, 8-302-A
- Chasing**, metal-decorating process, 12-80
- Chassidism**, Jewish sect, 5-138
- Chat Moss**, England, railroad built across, 10-186
- Château**  
development of, 11-486, †488-90  
Fontainebleau, France, 11-486, \*488  
Rambouillet, France, 11-\*490  
Versailles, France, 11-\*489, 490, 491
- Chateauroux, Marie Anne de Maillynesle**, duchess of, 6-186
- Chatham William Pitt**, Earl of, *see* Pitt William, the Elder Earl of Chatham
- Chattahoochee River**, Alabama and Georgia  
Alabama, 8-8  
Georgia, 8-84
- Chattanooga, Tenn.**  
historical park, 7-414  
manufacturing, 8-371
- Chattanooga, Battle of**, 12-538
- Chatterers**, birds, 4-178  
color plate, 4-\*184
- Chatterton, Thomas**, biography, 13-†204-5
- Chattooga River**, U. S., 8-356
- Chaucer, Geoffrey**, life and works, main article, 13-†141-44  
"Canterbury Tales," retold, 14-†329-36  
"Consolation of Philosophy," by Boethius, translated into English by, 13-58  
criticizes abuses of his time, 6-34  
English language standardized by, 10-18  
portrait, 10-\*18  
works printed by Caxton, 10-54
- Chaulmoogra oil**, drug, 9-219-A
- Chauntecleer**, in "Canterbury Tales," 14-†330-32
- Chautauqua, Lake**, in N. Y. state, 8-283

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Chautauqua Mountains**, Oklahoma, 8-316, 320-A  
**Chavannes, Puvis de**, *see* Puvis de Chavannes, Pierre C.  
**Cheaha Mountain**, Ala., height, 8-8  
**Check and checking account**, bank, 7-†518  
**Checkers**, game, 14-†463  
**Checks and balances in U. S. Constitution**, 7-181  
**Cheddar cheese**, how made, 9-\*344, 346-47  
**Cheek plates**, on helmets, 10-†352  
**Cheese and cheese making**, main article, 9-†344-48  
     bacteria an aid, 2-20  
     cause of various types, 2-20  
     coloring, 9-305  
     food value, 9-347  
     kinds, 9-347, 348  
     molds, 9-347; 2-76  
     where produced, 9-346, 347  
     United States, 9-338  
**Cheetah**, hunting leopard, 4-\*284, 296  
**Chehalis River**, Wash., 8-428  
**Cheka**, Russian organization, 6-440  
**Chekhov, Anton**, life and works, 13-95-96  
**Chelan, Lake**, Washington, 8-428  
**Chelsea ware**, 12-\*40  
**Chelsea Water Company**, London, sand filter, 10-542  
**Chemical affinity**, 1-545  
**Chemical analysis**, 10-545  
**Chemical compounds**, *see* Compounds, chemical  
**Chemical dyes**, 9-306  
**Chemical elements**, *see* Elements, chemical  
**Chemical energy**, 1-340, 345, 349  
**Chemical engineers**, 10-545  
**Chemical fertilizers**, 10-545-46  
     manufacturing plant, 10-\*547  
**Chemical industry**, in United States, 7-343-F;  
     *see also* Chemistry, industrial  
**Chemical Warfare Service**, 9-33  
     smoke screens devised by, 10-†364  
**Chemicals**, manufacture of, 10-548  
**Chemistry**, main article, 1-†530-58 (*see also* Contents Volume 1 for chapter headings and entries under main subjects listed below)  
     affinity, 1-545  
     agriculture makes use of, 10-545-46; 1-\*537; 9-153  
     alchemy laid the foundation of, 1-282; 13-164  
     alloys, 9-420  
     applied, 10-544-50  
     atomic theory, 1-281, 283, 532, 540; 13-2, 3, 383  
     atoms and molecules, 1-†354-57, †540-48; 10-544-45  
     biological, 10-545  
     catalyst, 9-271-B  
     cellulose, 9-86  
     coal-tar products, 9-307, 445  
     combustion, 1-†373, 384, 385  
     compounds, 1-†550-58  
     **Chemistry—continued**  
     contributions to modern world, 10-545 fol.  
     dyes, 9-†304-7  
     electrochemistry and electrolysis, 1-†496-500; 10-545  
     electrolysis of salt, 1-557  
     electrolysis of water, 1-†363-64  
     ionization, 1-558  
     elements, 1-†530-38  
     explosives, 10-†415-18  
     industrial, 10-547  
     coal tar products, 9-445  
     dyes, 9-307  
     rayon produced by, 9-83, 86  
     laboratory of nineteenth century, 1-\*282  
     law of definite proportions, 1-283, 553, 555, 557  
     milk analyzed by, 9-\*337  
     mixture, 1-552  
     organic, 10-548  
     carbohydrates, fats, proteins, 2-40  
     chemical energy of muscle fiber, 2-331  
     combustion of haemoglobin, 2-338  
     composition of fibrin, 2-348  
     digestion, 2-355-58  
     digestion of food by plants, 2-53, 60  
     effect of carbon monoxide combining with haemoglobin, 2-339  
     germ fighting chemicals in blood, 2-350  
     manufacture of urea in liver, 2-367  
     oxidation in cells, 2-360  
     oxidation in lungs, 2-333  
     photosynthesis, 2-43, 44  
     physical, 10-545  
     polymerization, 9-271-B, \*452  
     radium, 9-†424-26  
     sanitary, 10-545  
     solutions, 1-557  
     symbols and equations, 1-551 fol.  
     synthetic, 10-545  
**Chemists, biography; discoveries**, 13-†367-69, †378-88  
**Cavendish, Henry**, 13-†378  
**Dalton, John**, 13-†382  
**Davy, Sir Humphrey**, 13-†383  
**Faraday, Michael**, 13-†385  
**Lavoisier, Antoine L.**, 13-†380  
**Liebig, Justus von**, 13-387  
**Pasteur, Louis**, 13-†367  
**Priestley, Joseph**, 13-379  
**Chemurgic movement**, 10-546  
**Chenille**, cotton fabric, 9-29  
**Cheops**, king of Egypt, *see* Khufu  
**Cheribon Agreement**, 5-529-B  
**Cherimoyas**, tropical fruit, 9-\*195, 196  
**Cherokee Indians**, 8-6, 320-B  
     capital, 8-374  
     Houston's friendship with, 12-514-16  
     migration to Oklahoma, 8-316, 317  
     New Echota Marker, Georgia, 8-84  
     North Carolina, 8-288, 296-A  
     quarrels with Georgian colonists, 7-226; 8-79  
**Cherokee Rose**, state flower of Georgia, 8-84-A

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

- Cherries**, kinds; where grown, 9-†164, 166  
blossom, 2-†162
- Cherry birds** (waxwings), 4-29
- Cherry curculio**, beetle, 3-†341
- "Cherry Orchard, The,"** by Chekhov, 13-96
- Cherry trees**, Japanese, 5-†358; 12-†527
- Cherubini, Maria L. C. Z. S.**, and Berlioz, 12-305
- Chesapeake Bay**, 8-161, 410  
oysters, 8-416
- Cheseman, Robert**, portrait by Holbein, 11-†213, 214
- Cheshire cheese**, 9-348
- Chess**, game, main article, 14-†487-91  
famous contests; champions, 14-488-91
- Chest**, anatomy, 2-†352  
color plates, 2-†278, †326, †327  
use in breathing, 2-337
- Chesterfield, Philip Dormer Stanhope**, Earl of, Dr. Johnson in anteroom of, 13-†194
- Chestnut**, knob on leg of horse tribe, 4-508
- Chestnut, tree**  
blight, 2-141  
nut, 9-204  
seed protection by burrs, 2-†118, †127
- Chestnut-sided warbler**, bird, 4-†59  
graph of song, 4-†5
- Chests**, furniture, 12-179, †183 fol.  
Turkish carving, 12-†99
- Chetimaha Indian Reservation**, 8-146-A
- Chevet**, architecture, 11-455, 457
- Cheviot Hills**, range of hills between England and Scotland, 6-108-B
- Chewing gum**, 9-292, 293
- Chewing of food**, effect upon teeth, 2-311, 312
- Chewinks** (towhees), birds, 4-†136
- Cheyenne**, Wyoming, 8-452  
meeting of cowboys, 8-452  
temperature, 8-454
- Cheyenne Indians**, 7-†103; 8-451
- Cheyenne River**, U. S.  
South Dakota, 8-364  
Wyoming, 8-454
- Chiang K'ai-shek**, Chinese leader, 5-335; 6-564  
biography, 6-565
- Chiapas**, state, Mexico, map, 7-597
- Chiaroscuro**, *see* light and shadow in art
- Chibcha Indians**, 5-495
- Chicago**, Ill., 8-†101, 104  
a port of entry, 8-102  
and Cook County, 8-106-A  
central position, 8-94  
climate, 8-106  
fire, 8-104  
Fort Dearborn, 12-†522  
libraries, famous, 10-561  
literary center for period, 13-349  
location, 8-101  
mulling in, 9-236  
pioneer post office at, 10-86  
railroad center, 10-268  
stockyards, 9-†327, 329; 8-†100  
theme of poem by Sandburg, quotation, 13-348
- Chicago**, Ill.—*continued*  
water supply, 10-538  
World's Fair of 1893, architecture, 11-514  
World's Fair of 1933, 8-104  
opened by light from star Arcturus, 1-†413
- Chicago, University of**, Chicago, Ill.  
founding, 8-105  
medical school buildings, 8-†97  
observatory, 1-†154
- Chicago and Alton Railroad**, carries first "palace car," 10-196
- Chicago Drainage Canal**, 8-101  
distance navigable, 8-106
- Chicago fire**, 8-104
- "Chicago Poems,"** by Carl Sandburg, 13-350
- Chicago Tribune Building**, Saarinen's design, 11-†519
- Chichen-Itza**, Yucatan, Mayan pyramid, 7-†92
- Chickadees**, birds, 4-†61-62, 173  
nest building and breeding, 4-62  
use of woodpecker's hole, 4-68  
similarity of wee blue tit, 4-173  
state bird of Maine, 8-156-A
- Chickahominy Indians**, 8-412
- Chickasaw Indians**, 8-6  
Oklahoma land grant, 8-317  
one of "Five Civilized Tribes," 8-320-B
- Chicken**, Mother Carey's (petrel), 4-217
- Chicken snake**, 3-502
- Chicken terrapin**, 3-†479
- Chickens**, main article, 9-†350-58  
breeds, 9-†350, †352-53, 354  
domestication, 9-351  
drawing and mounting, 14-†69  
eggs and hatching, 9-351, 354, †356, 357  
marketing, 9-†325  
poultry farm, 9-†358  
prairie chicken, 4-†95, 97  
water chicken, 4-102, 109  
*see also* Eggs
- Chickens, sacred**, destroyed by Roman consul, 5-212
- Chickamauga and Chattanooga National Military Park**, Tenn., 7-414; 8-374
- Chickweed**, size, 2-250
- Chicle**, source; use in chewing gum, 9-†292-93
- Chicle tree**, 9-†290
- Chicopee**, Mass., 8-174
- Chicory root**, used with coffee, 9-132
- "Chicot the Jester,"** by Dumas, 13-128
- Chief**, Indian, color plate, 7-frontispiece
- Chief justice of the United States Supreme Court**, 7-366  
John Marshall, 7-†366, 367
- Chiefs**, primitive, government by, 7-347
- Chi'en Lung**, Chinese emperor, 5-331
- Chiffley, Benedict**, Australian premier, 5-560-C
- Chihuahua**, state, Mexico, map, 7-596
- Child labor**, 7-440  
Jane Addams crusader for abolition, 12-581  
legislation and regulation, 7-439

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Child Labor, legislation—continued**

Sweden, 6-407

United States, 7-312

Connecticut, 8-61

New Hampshire, 8-242-A

**"Child Writing,"** painting by Renoir, 11-\*382**"Childe Harold's Pilgrimage,"** by Byron, 13-226, 227

Berlioz's symphony based on, 12-306

**Childeric I,** king of the Franks, tomb, 6-350**Children**

accidents and accident prevention, 2-426, †427-30, 447

adoption through social agencies, 7-441

Family Allowance Act Canada, 7-29

first white children born in America

Snorri, 7-111

Virginia Dare, 13-480

libraries for, 10-558

life during Industrial Revolution, 6-84

Mohammedan, 5-423

Murillo's paintings, 11-\*255-56, 258

orphanages, 7-441

Reynolds' pictures of, 11-\*295-97

social welfare work for, 7-440-42

Spartan education, 5-155

teeth, 2-\*313, 314

Tibet, 5-439

weight and measurement, chart of averages, 2-363

*see also* Child labor**"Children on the Seashore,"** painting by Renoir, color plate, 11-frontispiece**Children's Crusade,** 5-283, route, 5-296**Children's homes,** *see* Orphanages**Children's organizations**

4-H Clubs, 7-457

boys' clubs, 7-442

Italy, 6-315

safety, 2-448

*see also* Boy Scouts, Girl Scouts**"Child's Garden of Verses, A,"** by Robert Louis Stevenson, 13-265**Chile,** country, So. Amer., description and history, 5-515, general data, 5-518-11

Araucanian Indians, 5-499

area, 5-518-11

birds, Franklin's gull, 4-203

boundary arbitration, 5-510

**"Christ of the Andes,"** statue, 5-†510

climate, 5-518-11

earthquake off coast of, 1-80

education, 5-515

flag, color plate, 14-following \*570, no. 12

government, 5-518-11

history, 5-505, 507, 510, 515

location, 5-518-11

map, 5-604

Mount Mercedario, 1-28

Mt. Osorno, 5-\*494

people, 5-518-11

physical features, 5-518-11

**Chile—continued**

products and industries

Chile saltpeter, 10-546

hemp, 5-\*516

minerals, 5-518-H

nitrate, 5-515

olives, 9-213

sheep raising, 5-\*514

provinces, 5-518-H

rivers, 5-518-H

Spanish conquest, 5-498

trade, Valparaiso center of, 5-\*517

merchant marine, number, 10-232

nitrate, 10-241

transportation; railroad, 10-200

**Chile saltpeter,** 10-546**Chilian sea eagle,** 4-\*154**Chilkat Indians,** 7-\*106**Chilkat River,** Alaska, 8-16**Chillicothe,** Ohio

founded, 8-306

national monument in vicinity, 8-312-B

**Chillon,** castle, Switzerland, 13-\*227**"Chillon, The Prisoner of,"** by Byron, 13-\*226, †227**Chimaera,** monster, slain by Bellerophon, 14-444**Chimborazo,** volcanic peak, Ecuador, height, 5-518-A**Chimney,** earliest, 10-380**Chimney,** of volcano, color plate, 1-frontispiece**Chimney swifts,** birds, 4-\*32, †38-39

nest building and breeding, 4-\*32, 38, 39

**Chimpanzees,** apes, 4-\*241, †244-47, \*474**Chin,** injured, how to bandage, 2-\*405**Ch'in dynasty,** name of China derived from, 5-319**Chin-Tsung,** Chinese emperor, porcelain factory, 12-59**China,** country, Asia, description and history, main article, 5-†313-36; general data, 5-336-A

agriculture, 5-318

farms, 7-460, 461

orange growing, 9-172

peanut growing, 9-199

rice growing, 9-†108-11

grinding, 9-\*234

soy bean cultivation, 9-\*211, 214

tea growing, 9-134, 135, 137, 138; 5-\*317

ancestor worship, 5-318

ancient astronomy, 1-100, 115, 164

ancient oil wells, 9-450

animal life

birds

chimney swift, 4-39

cormorant, 4-†212

pheasant, 4-†186, 187

tailor bird, 4-183

crocodiles, 3-441

pandas, 4-322-23

monkeys, 4-256

paradise fish, 3-233

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**China, animal life—continued**

- salamanders, 3-430
- sambar deer, 4-402
- takins, 4-430
- tigers, 4-291
- yaks, 4-396

**architecture**, 11-394, †400-1; *see also* Pagodas  
**area**, 5-336-A  
**art**

- painting, 5-†325-26
- sculpture, 5-†325

**August Periods in mythology**, 5-314

**China Medical Board founded by Rockefeller Foundation**, 12-584

**Christian missionaries**, 5-331, 333

**cities, chief industrial**, 10-264-66

**climate**, 5-336-A

- winds, 1-232

**communication**

- earliest newspaper, 10-73
- printing first used in, 5-326; 10-48
- see also below* transportation
- compasses used by ancients, 1-485
- conflict with Russia over Chinese Eastern Railway, 6-442

**costumes**, 9-19

- shoes, 9-56, 57

**crafts**

- bronze work, 12-\*15, 19
- carving, 12-\*97, 98
- cloisonné work, 12-64, \*66, \*68
- furniture, 12-\*187, 192, 194
- jewelry, 12-\*125
- lacquer work, 12-100; 9-291
- porcelain, 12-41, 42, †57 fol.
- rugs, 12-150, \*155, 156
- weaving, 12-140

**education**, 5-326-27, 336

**egg hatching**, 9-357

**extra-territoriality**, 5-332

**family, importance of**, 5-\*315, 318, \*319

**first to make steel needles**, 9-408

**flag, color plate**, 14-following 570, no. 13

**foot-binding**, 5-†318, 322; 9-56

**government**, 5-336-A

- mandarinate, 5-318, 319, 320, 331

- socialism, experiment in, 5-327

- Mongol Rule, 5-328

- under Hung Wu, Ming emperor, 5-329

- under the Manchus, 5-330, 331

- disorder after fall of Manchus, 5-334

- readjustment period; confusion, 5-334, 336

**Great Wall**, 10-\*357, 319, \*320

**headdress**, 9-\*88

**history**, 5-†313-36

- to 618, 5-†313-22

- "model emperors," 5-316

- Tatar invasions, 5-321, 327

**since 618**, 5-†324-36

- Genghis Khan and Mongolian invasion, 5-327

**China, history, since 618—continued**

"open door" policy of nations, 7-301

Boxer uprising, 5-333; 7-301

war with England, 5-331, 332

republic established, 5-334

relations with Japan, 5-333, 335, \*363, 364

recent civil war, 5-335; 6-500, 556, \*559

war in Manchuria, 5-336

Japanese invasion, 5-336

overrun by Communists, 6-564

**industries, *see below* products and industries**

**iron discovery, myth concerning**, 12-1

**kite festival**, 14-499

**learning and literature**, 5-321, 325, 330

**location**, 5-336-A

**maps**, 5-590, 581

**money and banks**, 7-507

**musical kites**, 12-203

**name, origin of**, 5-319

**New Years' customs**, 14-578

**opium trade**, 5-331; 9-217, 218

**pagodas**, 11-†394, †400-1; 5-\*313; 12-\*100

**paper first made in**, 5-321; 9-274; 10-\*43

**people**, 5-336-A, \*316, 318

- mandarinate, 5-318, \*319, 320, 334

- racial background, 5-†43, 314

**physical features**, 5-336-A; 10-265-66

**products and industries**

- bamboo, 2-180

- coal, 9-438

- cotton, 9-27

- jade, 5-437

- minerals, 5-336-A, 336-C

- pearl fishing, 3-163

- poultry, 9-358

- salt, 9-412

- silk industry, 9-†36-38

- tung oil, 10-547

- tungsten, 1-536

*see also* China, agriculture

**province of Sinkiang**, 5-436

**punishment of crime**, 5-\*329

**religions**, 5-319, 325, 331; *see also* Buddhism;

Confucianism; Taoism

**rivers**, 10-265-66

**search for route to**, 13-499, 504

- Cabot, 13-495

- Henry Hudson, 13-†475-77

**standard of living**, 7-462

**superstition about eclipses**, 1-118

**the Polos' visit to**, 13-445-46; 5-329

**Three Great Sages**, 5-318

**trade**, 10-236, 237, 265-66

- during Wu Ti's reign, 5-321

- merchant marine, number, 10-232

- opium, 5-331

- silk export, 9-38

- tea, 5-\*317; 9-135; 10-172

- affected by Russian Revolution, 7-578

- tobacco import, 9-223

- trade guilds, 5-318

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**China, trade—continued**

- Western World attempts to break barriers, 5-330, 331-32, 333
- transportation, 10-130, \*131, \*145
- canals, 10-270
- junks, 5-\*327; 10-\*161, \*165
- river, 10-265
- western interests and influence, 5-330-34
- women rulers, 5-325
- women's position, 5-318
- writing (ideographs), 5-315, 327; 10-37
- alphabet, 5-327
- early records, 10-\*43
- China clay**, 12-43
- China Clipper**, airplane, 10-325-26
- China Medical Board**, 12-584
- China rose**, 2-227
- China Sea**, Asia, maps, 5-591, 573
- Chinaware**, *see* Porcelain
- Chinch bug**, 9-33
- Chinchilla**, 4-379, \*385
- Chinchon**, Ana del, Countess, 9-217
- Chinese architecture**, *see* China, architecture
- Chinese Eastern Railway**, 6-443
- Chinese goose**, 4-\*122
- Chinese-Japanese War**, 5-†335
- Chinese labor**, in Australia, 5-559
- Chinese Revolution**, 5-334
- Chinese rugs**, 12-150, †155-56
- Chinese students in the U. S.**, 7-301
- Chinese tag**, game, 14-172
- Chinese wood oil**, 9-312
- Chinese writing**, *see* China, writing
- Chingachgook**, Indian, 13-297
- Chinook**, Indian dialect, 7-108
- Chinook**, wind, 1-231, 7-29 U; 8-327
- name, 1-231; 8-327
- Chinook Indians**, 8-328
- Chinook salmon**, 3-\*249
- Chinook State**, 8-428-A
- Chipmunk**, ground squirrel, 4-†369-70, 478
- snakes in burrows of, 3-492
- Chipp River**, Alaska, 8-16
- Chippendale**, Thomas, furniture by, 12-\*191, 194
- copied by Savery, 12-198
- Chippewa Indians**, 7-\*102; 8-440
- Minnesota reservations, 8-198-A
- Ojibway settlement, 7-29-Q
- Chipping sparrows**, birds, 4-†23, 12, \*86
- graph of song, 4-\*5
- Chiricahua National Monument**, Arizona, 7-419; 8-24
- Chisel**, how to use, 14-†25
- pneumatic, 9-\*381
- Chisel-toothed animals**, *see* Rodents
- Chishima**, group of islands, *see* Kuriles
- Chitagong**, pigmy rhinoceros, 4-348
- Chiton**, Greek dress, 5-110; 9-\*6, 8
- Chiton**, young of limpet, 3-146
- Chivalry**, age of, 5-\*306, †307
- exemplified in Malory's "Morte d'Arthur," 13-†145, 146

**Chivalry—continued**

- Louis IX of France an exemplar of, 12-376
- religion; service to womankind, 11-94
- three-fold service of knights, 14-393
- see also* Arthur, legendary British king; Knights and knighthood
- Chivalry**, Japanese code, 5-347
- Chives**, vegetable, 9-150
- Chloride of copper**, 1-558
- Chloride of silver**, glass stained with, 12-74
- Chlorine**, element
- bleach, 10-549
- chemical behavior, 1-548
- chemical manufacture, 10-548
- germ-killer, 10-542
- obtained by electrolysis, 1-558
- salt contains, 1-44, 357, 551
- separated by Davy, 13-385
- symbol, atomic no. and wt., 1-\*551
- water treated with, 10-542
- Chloropyrene**, synthetic rubber made from, 9-271 A, 271-B
- Chloroform**, boiling point, 1-\*392
- effect on nerves, 2-397
- Chlorophyll**, of plant, 2-8, 26
- algae contain, 2-67
- fungi lack, 2-74
- in red or purple leaves, 2-55
- photosynthesis performed by, 2-41
- why most plants are green, 2-44
- Chloroplasts**, of cell, 2-\*7, 8, †26, 41, \*42
- algae, 2-68
- Chocolate**, how obtained, 9-177, 178
- see also* Cacao tree
- Chocolate shops**, of Europe, in eighteenth century, 9-113
- Choctaw Indians**, 8-6
- Mississippi reservations, 8-206-A
- Oklahoma, 8-317
- one of "Five Civilized Tribes," 8-320-B
- Choctaw-Chickasaw Treaty of 1866**, 8-320-B
- Choctawhatchee River**, U. S., 8-76
- Choir Organ**, 12-258-D
- Choir stall**, carved, 12-\*105
- Choke valve**, of automobile, 10-†284
- Choking**, treatment for, 2-402
- Cholo Indians**, of the Andes, 5-\*504
- Chondus crispus*, red alga, 2-\*67
- Chop oil**, 9-190
- Chopin, Frédéric**, life and works, main article, 12-†291-93
- George Sand, 12-292
- monument to, 12-\*292
- music, 12-245
- portraits, 12-\*241, \*292
- recognized by Schumann, 12-290
- Chops**, tropical drink, 9-190
- Chopsticks**, 5-\*330
- Choral (Ninth) Symphony**, by Beethoven, 12-258-A
- Choroid coat of eye**, 2-\*296, 297, \*299
- Chorus**, music, 12-213

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Chorus**, in Greek drama, 13-33  
**Chosen**, *see* Korea  
**Chosen people**, *see* Jews  
**Chou dynasty**, China, 5-317  
**"Chou Li,"** ancient Chinese book, 5-319  
**Chouteau, René Auguste and Jean Pierre**, 8-224  
**Christ**, *see* Jesus Christ  
**Christ Church**, Boston ("Old North Church"), 11-508  
**"Christ of the Andes,"** statue, 5-†510  
**"Christabel,"** by Coleridge, 13-218  
**Christian I**, king of Denmark, efforts to hold Sweden, 6-397, 412  
**Christian II**, king of Denmark, reign, 6-413  
   treatment of Sweden, 6-397  
**Christian III**, king of Denmark, reign, 6-413  
   subjection of Norway, 6-386  
**Christian IV**, king of Denmark, reign, 6-†414  
   Norway, 6-388  
**Christian V**, king of Denmark, 6-415  
   Norway, 6-388  
**Christian VI**, king of Denmark, reign, 6-415  
**Christian VII**, king of Denmark, reign, 6-415  
**Christian VIII**, king of Denmark, reign, 6-416  
**Christian IX**, king of Denmark, 6-416  
**Christian X**, king of Denmark, 6-416  
**Christian Frederick**, Danish prince, offered crown of Norway, 6-390  
**Christian architecture**, *see* Church architecture  
**Christian art**  
   beginnings, 11-†73-78  
   Byzantine, *see* Byzantine art  
   medieval, 11-†83-90  
   mosaics, 11-†77-78  
   Spain, 11-242  
   symbolism, 11-27, 74, 77, 89; 13-527  
   *see also* Church decoration and ornament;  
     Jesus Christ in art; Madonna in art  
**"Christian Hero, The,"** by Steele, 13-180  
**Christian Science**, 13-557-58  
**Christian Science Mother Church**, 13-555  
**Christian Science publications**, 13-558  
**Christian Socialists**, political party in Austria, 6-275  
**Christian symbolism**, 11-27, 74, 77; 13-527  
   Heaven symbolized, 11-89  
**Christiania**, Norway, *see* Oslo  
**Christianity, rise and growth**, main article, 5-†273-84  
   a product of the Semites, 5-44  
   Abyssinia, 5-460  
   Africa, 5-460  
   and stoicism, 13-11  
   ancient Rome, *see* Christians, early  
   Arian, among Goths, 6-319  
   China, 5-325, 331  
   Christians sell maidens in Mohammedan slave markets, 5-408  
   Clovis adopts and spreads, 5-291; 6-166  
   Constantine's conversion, 5-250, 253, 288; 12-365  
**Christianity--continued**  
   Coptic, 5-73, 460  
   Europe, modern, 6-162-D  
   Golden Rule, 8-333  
   Hawaiians converted to, 8-458  
   India, 5-372  
   Indo-China, 5-429  
   introduced and adopted  
     Britain, 6-6-8, 9, \*110  
     Denmark, 6-409, 410  
     Finland, 6-456  
     Gaul, 6-167  
     Hungary, 6-278  
     Iceland, 6-419  
     Ireland, 6-145  
     Lithuania, 6-448  
     New Zealand, 5-534  
     Norway, 6-381, 382  
     Poland, 6-445  
     Russia, 6-425  
     Scandinavia, 6-377  
     Scotland, 6-487, 488  
     Sweden, 6-393  
     Switzerland, 6-246  
     Wales, 6-137  
   Japan, 5-354, 356  
   Madagascar, 5-464  
   made legal religion of Roman empire, 5-250, 253, 288, 12-365  
   Mexican Indians, 7-81  
   Middle Ages, 5-271, †275-84  
     civilization advanced by, 5-271, 280  
   missionaries, *see* Missionaries  
   Mohammedan attitude toward, 5-416, 422  
   Nicene Creed, 12-365  
   North America, today, 7-33 A  
   persecution of Jews by Christians, 5-134  
   Philippines, 8-464  
   St. Augustine in Africa, 13-533  
   treatment of Christians by Turks, 5-412  
   *see also* Christians, early; Church history;  
     Crusades; Holy Roman Empire; Reforma-  
     tion; Roman Catholic church  
**Christians**, early, 5-†274  
   architecture, 11-†440-43  
   art, 11-†73-81, 83-90  
   catacombs, 5-251, \*273; 12-211; 11-75  
     440, \*441  
   gladiatorial games ended by, 5-249  
   music, 12-210-12  
   persecution and martyrdom in Rome, 5-234,  
     236, \*251, 252, \*273, †274; 11-†440  
     under Marcus Aurelius, 13-57  
   Pliny the Younger's attitude toward, 13-54  
   worship, 12-210-12; 11-74, †440-43  
**"Christians Escaping from Druid Persecution,"**  
   painting by Holman Hunt, 6-110  
**Christianson, Hendrik**, 8-272  
**Christina**, queen of Denmark, and Sten Sture  
   the Elder, 6-412  
**Christina**, queen of Sweden, character, 6-401  
   calls Descartes to Sweden, 13-14

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Christina**, wife of Sten Sture the Younger, 6-397, 413
- Christinaham**, early settlement now Wilmington, Del., 8-64
- Christmas**, observance; customs, 14-†588-590  
 • dramatic entertainment, 12-326  
 "The Second Shepherd's Play," a Christmas miracle play, 12-327
- Christmas candle**, game, 14-151
- "Christmas Celebration,"** painting by John Steen, 11-†266
- Christmas Island**, dependency of Singapore, 5-430-B
- Christmas tree**  
 ancient German custom, 6-205  
 evergreens used as, 2-94, 98  
 how to make support for, 14-†38  
 lights, principle of, 1-517
- Christophe, Henri**, king of Haiti, 7-57
- Chromatic harp**, 12-258-A
- Chromatic scale**, music, 12-258-A
- Chrome brick**, in furnaces, 9-420
- Chrome process** for tanning, 7-577
- Chromite**, mineral, 9-420
- Chromium**, metal, 9-420  
 use in tanning, 9-68  
 symbol, atomic no., atomic wt., 1-†551
- Chromosomes**, of plant cell, 2-99, 10, †279
- Chromosphere**, of sun, 1-118
- "Chronicle,"** by Froissart, 13-104
- Chronicle, Anglo-Saxon**, *see* Anglo-Saxon Chronicle
- Chronicle plays**, 12-327
- Chrysalis**, *see* Pupa stage of insects
- Chrysanthemums**, 2-†170  
 breeding, 2-227
- Chrysanthemums, Wars of the**, 5-350
- Chrysler Building**, New York, 11- 517, †518, 522, 7- 532
- Chu-ko Liang**, Chinese general, 5-321
- Chu Yuanchang** (Hung Wu), Chinese emperor, 5-329
- Chub sucker**, fish, 3-†227
- Chuck roast**, amount from steer, 9-†328
- Chuckawalla**, lizard, 3-†463
- Chuck-will's-widow**, bird, 4-77
- Chungking**, China, 10 264
- Church**, *see* names of denominations, as Church of England; Roman Catholic church
- Church and state**  
 England: the Church of England, 7-124  
 France: the Revolution, 6-192  
     under Napoleon, 6-194  
 Italy: Catholicism recognized as state religion, 6-315  
 Massachusetts colony, 7-126  
 Middle Ages: contests between popes and emperors, 5-276, 283, 286, 294-99, 6-170, †208, 295; 7-†357  
 Mohammedan countries, 5-414, 423  
 Scotland: Episcopal government rejected, 6-124
- Church and state—continued**  
 Turkey: separation, 5-414  
 Wales: disestablishment accomplished, 6-141
- Church architecture**  
 American, 8-†60; 11-†502, †503, †507, †508, †515, †521  
 basilicas, 11-†441-43  
     Forum, Rome, 5-†221, 228, †231  
 Byzantine, 11-†445-49  
 early Christian, 11-†440-43  
 Gothic, 11-†459-70  
     cathedrals in America, 11-†521  
     Norwegian, 11-†462  
 Renaissance, 11-†483, †484 fol.  
 Romanesque, 11-†452, 454-55  
*see also* Cathedrals; Churches; Mosques
- "Church at Old Lyme, The,"** painting by Childé Hassam, 11-†366
- Church colonies**, New Zealand, 5-537
- Church decoration and ornament**  
 bronze, 12-20, †21  
 Byzantine, 11-†76, †77, †79-81; 5-405  
 carving, 12-†105, 107  
 early Roman, 11-76-78  
 enameling, 12-66  
 goldsmith's work, 12-86  
 ironwork, 12-†7, 8  
 jewelry, 12-124, 125  
 laces, 12-†164  
 medieval, 11-†85-90  
 mosaics, 11-77, †78; 12-112  
 stained glass windows, 12-†70-77; 11-100, †101
- Church furniture**, 12-†181-82
- Church history**  
 councils  
     Clermont, 5-282  
     Constance, 6-300; 13-†536, 537  
     Nicaea, 12-365  
     Trent, 12-260  
 crusades, 5-280-83, 408  
 early, 5-†273-84  
 heresy, 5-283  
 Inquisition, *see* Inquisition  
 investiture, 6-208  
 Irish and Roman in early England, 6-9-11  
 Middle Ages, 11-96, 470  
     corruption, 5-277  
     ideals of knighthood, 5-307  
 persecution and martyrdom in ancient Rome, 5-†273, †274  
 religious intolerance in England, 6-35  
 Western and Eastern churches, 5-275, 276, 407, 408  
 Wycliffe's efforts for reform, 6-33  
*see also* Christianity; Church and State; Counter-Reformation; Monks; Papacy; Protestantism; Reformation; Roman Catholic church
- Church music**, *see* Music, sacred
- Church of Christ, Scientist, The**, 13-555

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Church of England**

- attempts to establish in Scotland, 6-124
- Episcopal form of government, 6-124
- established by Henry VIII, 6-45; 12-392
- Ireland, 6-152
- New World
  - Maryland, 8-159
  - South Carolina, 8-350
  - Virginia, 8-12
- Puritan attitude toward, 12-407, 408
- quarrel that sent settlers to America, 7-124
- service established by Elizabeth, 6-52
- state church; first prayer book in English, 6-48
- Wales, 6-140
- see also* Reformation

**Church schools, medieval, 5-280****Churches**

- building of earliest, 11-75
- demolished by Mohammedans, 5-423
- demolished during religious wars, 6-\*213
- early American, 11-\*497, 499
- English, 11-475
- medieval abbeys, 11-87
- New England, 8-\*60
- organs in, 12-258-D
- see also* Cathedrals; Church Architecture; Mosques, and names of churches, as Ascension, Church of

**Churchill, John, *see* Marlborough, John Churchill, Duke of****Churchill, Lady Randolph, 12-449-A****Churchill, Randolph, British statesman, 12-449 A**  
biography of, by his son, 12-449-C**Churchill, Winston, American author, 13-347****Churchill, Winston, former British premier, life, main article, 12-†449-A-449-C**  
anti-Communist, 12-449-F  
in World War II, 6-509, 526, 527, 529, 536, 539, 544, 546, 547, 549  
portraits, 6-\*510, \*542, \*545 \*548; 12-\*449-A**Churchill River, Canada, 10-253**

map, 7-592

**Churka, cotton gin, 10-404****Churn, butter, 9-340, \*341, 342****Chyme, in stomach, 2-357****Cibola, Seven Cities of, 7-119****Cicadas, insects, 3-†370-73; 2-261****Cicero, Marcus Tullius, life and writings, main article, 13-†46-47**

Caesar opposed by, 5-223

motto of Wyoming taken from, 8-454-A

portrait bust, 13-\*47

proscribed by Octavian, 12-362

**Cid, the (Ruy Diaz de Bivar), 6-322****"Cid, The," drama by Corneille, 13-110****Cider, 9-161, 163****Cienfuegos, city, Cuba, 7-60****Cigar boxes, cedar used in, 7-60****Cigar boxes, power house of, 14-†37****Cigarettes, 9-223, \*224****Cigars, 9-223; Havana, 7-56****Cilia, in Vorticella, 2-\*280**

bacteria, 2-12, \*14, 15

sponges, 3-84

**Ciliary arteries, 2-\*296****Ciliary muscles, 2-\*296****Cimabue, Giovanni, art style, 11-†110 fol.**

"Taking of Christ," painting, 11-\*112

**Cimarron River, U. S., 8-131****Cimbri**

defeat of Roman army, 5-219

iron weapons, 12-4

raid Romans in Gaul, 6-244

**Cimmerians, mythological people, 13-493****Cinchona bark, 9-217; 5-518 B****Cincinnati, Ohio, 8-308-9, 312**

earliest years, 7-214, 215

founding, 8-307

industries, 8-310; 12-61

**"Cinderella," fairy tale, text, 14-†241-43**

color plate, 14-\*241

**Cinema, *see* Moving pictures****Cinnabar, pigment, 9-416****Cinnamon, spice, 9-209****Cinnamon fern, 2-\*91**

prehistoric, 3-51

**Cinnamon tree, peeling bark of, 9-\*207****Cinto, Mont, Corsica, 6-472****C.I.O., 7-563****Cion, botany, 2-\*231**

in grafting process, 2-231

**Cipango, name for Japan, 13-445; *see also* Japan****Cipher writing 14-†143-48****Circe, in mythology, 14-†420, 421, 13-30****Circle, geometric figure, 10-438-39**

Gothic decoration, 12-182

Roman architecture, 11-430

symbol of perfection, 1-288

**Circuit, electric, 1-514-15**

cause of breaks in, 1-515

telegraph, 10-†98

telephone, 1-519, 520

**Circuit breaker, in trolley car, 1-312****Circulation of blood, *see* Blood****Circumference, of earth and planets, table, 1-106****Circus, Barnum's, main article, 12-†575-79**

clowns, 12-†575, \*576

invented by Romans, 12-325

**Cire perdue, method of bronze casting, 12-18****Cirripeds, barnacles, 3-189****Cirro-cumulus clouds, 1-237****Cirrus clouds, 1-235, \*247****Ciselure, carving process, 12-107****Cistercians, religious order, 13-535****Citadel, the, temple at Teotihuacan, 7-\*69****Citeaux France, monastery, 13-534****Cities**American, *see* subhead cities under various states.

architectural development; skyscrapers, 11-

†515-19, †510, \*520, †522, 524; 9-\*385

Aztec, 7-72

government, *see* Municipal government

Industrial Revolution, 7-241

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Cities—continued**

- Italian**  
 Lombard League, 5-298  
 medieval, 6-\*292, 296, 299  
 rivalry in art, 11-112  
 turn against pope, 5-299  
 location, important factors in, 10-252, 253  
 Mayan, 7-90  
 medieval, growth and independence, 7-352  
   Hanseatic League, 6-386, 395, 411, 459;  
   7-352  
   Latin League, 5-205  
 modern, 11-515-16  
 mound cities, 5-76, 78; 11-404  
 Nuremburg, medieval quaintness, 5-\*309  
 planning, *see* City planning  
 public health, 7-423  
 public libraries, 10-558  
 relation to counties, 7-386  
 relation to manufacture and trade, 7-352,  
   \*510; 10-\*198  
 rent of land, 7-537  
 result of Industrial Revolution, 7-436  
 slums, 7-283; clearance, 9-\*385  
 trade with agricultural sections, 7-571  
 transport, 7-399; 10-\*198, \*199  
 water supply, 10-†546-53
- Citizen Military Camps**, U. S., 7-475
- Citizenship**, in United States, U. S. text of Con-  
 stitution, 7-189, *see also* Community
- Citlalteptl, Mount**, *see* Orizaba, Mt.
- Citric acid**, 9-175
- Citron**, fruit, 9-175
- Citrus fruits**, main article, 9-†170-75  
 breeding, 9-172  
 California's industry, 9-†170, 173  
 Florida's industry, 9-173  
 grapefruit, 9-173  
 lemons, 9-170, 175; 14-554  
 oranges, 9-170 *fol.*; 2-\*230, 256  
 vitamins in, 9-175
- City government**, *see* Municipal government
- City hall**, uses, 7-401
- City-manager plan**, of government, 7-393
- City of Brotherly Love**, *see* Philadelphia
- "City of God, The,"** by Saint Augustine, 13-533
- "City of New York,"** Byrd's ship, 13-\*512
- City Dionysia**, spring festival, 12-325
- City planning**, main article, 7-†446-48  
 Chicago, 8-104  
 Des Moines, Iowa, 8-118
- City-states**  
 Greece, ancient, 5-153, 155, 175  
 Venice, 11-446
- Civet**, animal, 4-\*284, 296  
 prehistoric, 3-57
- Civet**, perfume, 4-296; 8-332
- Civil Aeronautics Authority**, 10-323
- Civics**, *see* Government
- Civil Aeronautics Administration**, 10-328-D
- Civil law**, defined, 7-387
- Civil Service Commission**, Theodore Roose-  
 velt's work on, 12-543
- Civil Service system**, 7-373  
 Pendleton Act, 7-287  
 initiated in England by William Ewart Glad-  
 stone, 6-100
- Civil War**, United States, main article, 7-†252 65  
 advantages of each side, 7-258  
 Army of the Potomac, 7-260, 262, 263; 12-535  
 army officer's uniform, 7-\*473  
 blockade, 7-258  
 canned food used, 9-228  
**causes; events leading to**, 7-†241-50, 253-55  
   Compromise of 1850, 7-247; 12-519  
   Confederate States of America formed,  
   7-250  
   cotton raising, 7-245, 246  
   Dred Scott Decision, 7-250; 12-456-B  
   efforts to save Union, Clay; Calhoun;  
   Webster, 7-247  
   John Brown's Raid, 12-534  
   Kansas-Nebraska Bill, 7-248; 12-534  
   Missouri Compromise, 7-218, 12-519  
   repealed, 7-248  
   slavery, 7-217, †244-48, 250, 254  
   Garrison, 7-246  
   "Uncle Tom's Cabin," 13-317, 319  
   states' rights theory  
   Calhoun, 12-522  
   Webster, 12-524  
   tariff, 7-246; 12-521  
   Clay, 12-518  
 changes in Constitution brought about by,  
   7-369  
 Confederate and Union states line up, 7-255  
 Decoration Day first observed during, 14-584  
 effect on canning industry, 9-228  
 Emancipation Proclamation, 7-263; 12-532  
 Europe's attitude, 7-258  
 events, 7-†255-65, \*252  
   Antietam, 7-262  
   Bull Run, 7-260; 12-539  
   Chancellorsville, 12-539  
   Chattanooga, 12-538  
   Farragut at Mobile, 7-†264, 265  
   Fort Sumter fired upon, 7-255  
   Fredericksburg, 7-262  
   Gettysburg, 7-263  
   Lee's surrender, 7-265  
   "Merrimac" and "Monitor," 7-\*259; 10-  
   †360; 13-439  
   New Orleans taken by Farragut, 7-260  
   Olustee, Battle of, 8-71  
   Petersburg, 7-\*252  
   Philippi, 8-434  
   Richmond, 7-260, 264, 265  
   Sheridan's ride, 7-\*260  
   Sherman's march to the sea, 7-264  
   Shiloh, 7-260  
   Vicksburg, 7-260, 263  
   Wilson's Creek, 8-211  
   Winchester, 7-\*259

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Civil War--continued**

exchange of prisoners, 7-†261

Grand Army of the Republic, 7-†257

**leaders**

Davis, 7-250

Farragut, 7-260, 264

**Grant**, biography, 12-†535-38; 7-271

Hancock, 7-286

**Jackson**, biography, 12-539; 7-260**Lee**, biography, 12-†525-26**Lincoln**, biography, 12-†527-32

McClellan, 7-\*258, 260, 262, 265

Meade, 7-263

Sheridan, 7-\*260

Sherman, 7-\*263, 264

Thomas, 7-264

*see also in index names of chief leaders, as*

Lee; Lincoln

marines, 7-493

monuments, 7-414

naval officer's uniform, 7-\*483

navies, 7-483

**results of war: Reconstruction Period, 7-†267-74**

"black codes," 7-268, 269

carpetbaggers, 7-272

Georgia affected by, 8-81

Ku Klux Klan, 7-†272-74

negro vote, 7-274

Reconstruction Act, 7-270

Virginia affected by, 8-412

**stand taken by states; participation in war**

Arkansas divided, 8-28

Delaware, 8-66

Florida, 8-71

Illinois, 8-102

Indiana, 8-113

Louisiana, 8-143

New York, 8-277

North Carolina, 8-293

South Carolina, 8-354

Tennessee, 8-366, 370

West Virginia, 8-433, 434

Wisconsin, 8-443

subject of fiction writers and poets, 13-346, 354

**Civil Wars, England, 12-407-9****Civilian Conservation Corps, 7-\*340; 2-243****Civilians**, in modern warfare, 10-368**Civilization**, meaning, 5-42, 262-71

Aegean, 11-415-17

Age of Reason supplants Age of Faith, 5-299

animals, domestication of. *see* Animals, as  
beasts of burden

Arabs, contributions, 5-395, 399

Aramaean's contributions, 5-89, 91

alphabet, 5-91

arts and crafts, *see* Contents Volume 12

barbarism, 5-42,

Battle of Tours; significance, 5-292

British contributions, 6-1

government, 7-353

**Civilization, British contributions--continued**

Irish influence, 6-146

Scotch influence, 6-134

**Byzantine**, 5-288-89, 405

Chaldean contributions, 5-97

Charlemagne fosters, 5-292-93

chemical knowledge furthers, 10-558

Chinese, contributions, 5-336

cities, *see* Cities**climate influences**, 1-†193-97**communication**, *see* Contents Volume 10; *see also* Communication

cradles of, 5-†76, 82; 9-240

**economics**, progress from simple life to complex, 7-†495-587

enemies of, 5-45

Etruscan influence, 5-194

European spread to new countries, 5-271

fire; importance to, 10-334

food, search for affects, 1-194, 196

French, contribution to government, 7-354-55

fuels, early use

coal, 9-435

oil, 9-450

Germanic or Teutonic peoples, 6-205-6

**government**, 7-†345-59, *see also* Government

Greek, contributions, 5-149

alphabet, 5-112

architecture, 11-417

art, 11-36, 46

government, 7-348

inspiration for Western World, 5-\*166

literature, *see* Greek literature

philosophy, 13-1

science, 13-1

Hittites; iron, 5-115

horse, importance to, 5-87

Indian contributions, 5-387

Industrial Revolution, 6-84

invention of wheel; importance to, 10-143

Jewish contributions, 5-118, 129, 134

language, *see* Languages**life before dawn of Civilization**, 5-†23-40;*see also* Man, prehistoric, Barbariansliterature, *see* Literature**Machine Age**, 6-84medieval, 5-†263-311, *see also* Middle Ages

metals, first used, 9-419

migration of peoples, 5-262, 264-71, 289-90

Persian contributions, 5-105

Phoenician contributions, 5-110, 111, 112

pottery, probable origin, 12-41

**prehistoric**, 5-23-40

printing, significance, 10-47-48

progress from East to West, 6-15

religion's part in, 5-270, 271, 280, 289

*see also* Monks and monasticism**Renaissance**, *see* Renaissance

Roman, 5-242, 254, 270

savagery, 5-42

Semitic peoples, 5-97

**shelter**, evolution of, 11-†394-401

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Civilization**—*continued*

- spread, 5-263 fol.  
aided by establishing common language, 5-280
- Cretan civilization influenced by Egyptian culture, 5-144
  - crusades, 5-283
  - Greek art influenced by Asiatic art, 11-29
  - Greek culture influences Jews, 5-127, 129
  - Greek scholarship carried to Europe, 5-412
  - Greeks pass knowledge of iron to Romans, 12-4
  - religion's part in, 5-270, 280
  - Roman art influenced by Greek art, 12-180; 11-60, 61, 67
  - Roman culture influenced by Greece, 5-218, \*227, 229; 11-61
  - Rome, 5-270
  - Spain influenced by Greek culture, 6-318
  - trade, 7-571-78; 10-†231-42
  - Phoenicians, 5-110
  - tools, Stone Age to Iron Age, 9-399
  - trade, importance to, 7-571-78; 10-†231-42
  - barter, 7-502
  - beginnings, 5-40
  - transportation, *see* Contents Volume 10; *see also* Transportation
  - United States, 6-1
  - writing, 10-†34 45
  - see also* Agriculture; Architecture; Art; Cities; Education; Religion
- Cladophora**, algae, 2-\*67
- Claiborne, William**, figure in Maryland's history, 8-159
- Clairvaux**, France, St. Bernard founds monastery at, 13-535
- Clam catchers**, nickname for people of New Jersey, 8-252-A
- Clam State**, nickname for New Jersey, 8-252-A
- "Clams,"** nickname for people of New Jersey, 8-252-A
- Clams**, shellfish, 3-†152, \*153, \*155, \*260-62
- anatomy, 3-†152
  - found in Mississippi, 9-\*52
  - fresh water, 3-\*260, 9-\*51 2, \*369
  - how obtained, 3-\*260, 9-\*51 2, \*369
  - pearls obtained from, 3-†262
  - salt water, 3-†152, \*153, \*155
  - shell used by Gobi for eggs, 3-211
  - struggle with starfish, 3-\*132
- Clapperton, Hugh**, explores Sahara, 5-453
- Clara, Saint**
- church robe made by, 12-164
  - second Franciscan order started by, 13-529
- Clare, Richard de**, Earl of Pembroke and Strigul, 6-148
- Clarendon, Edward Hyde**, 1st Earl of, proprietor of South Carolina, 8-350
- Clarendon, Constitutions of**, 6-21
- Clarinet**, musical instrument, 12-258-A
- Clarinet symphony**, 12-258-B
- "Clarissa Harlowe,"** by Richardson, 13-187

**Clark, George Rogers**, 7-†208

- expedition's influence on boundary, 7-170
  - Northwest Territory won, 8-97, 111
  - outfitted by Virginia, 8-112
  - portrait, 7-\*208
- Clark, William**, life, main article, 7-†220; 13-†491-92
- expedition with Lewis, 7-†207, \*209, †220; 12-506; 13-491-92
  - portrait, 13-\*492
  - signing treaty with Indians, 7-\*209
- Clarke, Charles Cowden**, association with Keats, 13-230
- Clarke, John**, American colonist, 8-344
- Clark's Fork of the Columbia River**, U. S., 8-92-A, 220
- Clasper, Harry**, racing shells improved by, 14-532
- Class wars**, Karl Marx's theories, 7-549
- Class distinction**
- caste system, India, 5-368, 372
  - Chinese mandarins, 5-\*318, \*319, 320
  - indications of rank in costume, 9-5, 52, 92
  - Russia, 6-443
  - proletariat's struggle against upper classes, 7-549, 550
- "Classic of Reason and Virtue,"** by Lao-tse, 13-517
- Classical architecture**, *see subhead* architecture under Greece and Rome; and *also* Classicism
- Classical art**, *see subhead* art under Greece and Rome; and *also* Classicism
- Classical literature**, *see* Greek literature; Roman literature
- Classicism**, 11-482
- American architecture, 11-512, 514
  - contrasted with romanticism, 12-243
  - drama
  - Racine, 13-113
  - "three unities," 12-330
  - furniture, 12-194
  - music, 12-246, 302
  - painting, 11-235
  - sculpture, 11-\*290, 291, \*325
- Clatsop, Fort**, built by Lewis and Clark, 13-492
- Claude, Professor**, attempt to tap new energy source, 1-\*346
- Claudius I**, emperor of Rome, 5-235, 236
- Claudius, Appius**, Roman censor, 5-\*205
- Claudius, Publius**, Roman consul, 5-212
- Clavichord**, musical instrument, 12-258-D, \*221, 222
- Bach's pieces for, 12-231, 232
  - description, 12-231, 264
- Clavier**, musical instrument, 12-231, 232
- Claw and ball foot**, furniture, 12-\*191
- Claws**
- anteater, 4-450
  - bear, 4-312
  - birds, 4-13, 66, 151, 233, 238
  - cat family, 4-286, 287, 484
  - centipede 3-265

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Claws**—*continued*  
 crustaceans, 3-176, 186  
 dog, 4-300  
 kangaroo, 4-460  
 scorpion, 3-412  
 worn as necklace by Indians, 4-315
- Clay, Henry, life**, main article, 12-†517-19  
 addressing Senate, 12-\*517  
 candidate for president, 12-518; 7-222  
 Compromise of 1850, 7-247  
 compromise tariff, 7-226  
 death, 7-248  
 home, 12-\*519  
 lived in Lexington, Ky., 8-134  
 portrait, 12-\*518  
 program, 7-236
- Clay, 1-40**  
 adobe and bricks made from, 9-376, 378; 5-102  
 aluminum found in, 9-420  
 earthenware and porcelain contains, 12-42, 43  
 firing, 12-\*43, 44  
 geologic eras found in, diagram, 1-\*40  
 modeling, 14-†57  
 New Jersey mines and manufactures, 8-247  
 pencil lead contains, 1-1  
 where found  
   earth's surface, 1-40  
   floor of ocean, 1-67  
   soil, 1-96
- Clay-eaters**, nickname for natives of South Carolina, 8-356-A
- Clay industry**  
 Wisconsin, 8-444  
*see also* Pottery
- Clay tablets**  
 Assyrian, 5-92  
 Babylonian, 5-86, †87; 9-\*276; 10-\*43, 44, \*74  
 Chaldean, 5-†96  
 Cretan, 5-144  
 Sumerian, 5-†78  
*see also* Cuneiform inscriptions
- Claypole, Lady Elizabeth**, 12-\*407
- Clay's Compromise**, or **Omnibus Bill**, extension of slavery, 12-456-C
- Clayton Act**, 7-316
- Cleanliness and health**, 2-291, \*419, 420
- Clear Lake**, Calif., 8-42-A
- Clearing house**, for banks, 7-519
- Clearstory** (clerestory) windows, 11-442
- Clearwater**, Fla., resort city, 8-75
- Clearwater River**, Idaho, 8-92-A
- Clearwing**, moth, 3-292
- Cleft grafting**, 2-\*231
- Cleis**, Sappho's daughter, 13-30
- Clemenceau**, Georges, 6-†201  
 portraits, 6-\*201; 12-\*550
- Clemens, Samuel Langhorne (Mark Twain)**,  
 life and works, main article, 13-†327-30  
 and William Dean Howells, 13-331  
 cited, 12-568  
 drollness of stories, 13-43  
 dubs period, "Gilded Age," 7-276
- Clemens, Samuel Langhorne**—*continued*  
 portrait, 13-\*329  
 quoted, on cats, 4-483  
 river pilot, 13-328
- Clement IV**, pope, encourages Roger Bacon, 13-375
- Clement**, Irish scholar, 6-146
- Clemm, Virginia** (Mrs. Edgar Allan Poe), 13-315
- Clemson**, S. C., textile school, 8-356
- Clemson College**, S. C., Calhoun house, 12-\*517
- Cleodolinda**, Princess, saved by St. George, 13-525
- Cleopatra VI**, queen of Egypt, life, main article, 12-†360-61; 5-\*226  
 and Caesar, 12-359  
 and Mark Antony, 5-225; 12-363  
 cartouches, 10-\*38  
 court, 5-\*70  
 dissolves pearl in wine, 3-162  
 serpent that brought death to, 3-†490  
 sister of Ptolemy, 5-72
- "Cleopatra, The Departure of,"** painting by Claude Lorrain, 11-\*238
- Cleopatra's Needle**, obelisk, 5-\*63; 10-\*468
- Clepsydra** (water clock), 10-†461
- Clerestory** (clearstory) windows, 11-442
- Clergy**, English, wealth of, 6-33
- Clergy Reserves**, Canada, 7-16
- "Clermont,"** Fulton's ship, first voyage, 10-217, †218, 221
- Clermont, Council of**, 5-282
- Cleveland, Frances Folsom** (Mrs. Grover Cleveland), 12-563
- Cleveland, Moses**, 8-306
- Cleveland, Stephen Grover**, president of U. S., 12-456-B; 7-287-90, 292  
 birthplace, N. J., 8-251  
 Hawaiian situation, 8-460  
 portrait, 7-\*289  
 threatens war on England, 5-517
- Cleveland, Ohio**, 8-312  
 derivation of name, 8-306  
 iron imported, 8-311
- Click beetle**, 3-388
- Clifden**, village, Ireland, 6-\*158
- Cliff drawing**, *see* Picture writing
- Cliff dwelling**, 7-†93-95, 421; 11-\*397  
 Bandelier National Monument preserves, 8-262-A  
 Canyon de Chelly National Monument, 8-24  
 Gibraltar House, Hovenweep, Colo., 5-\*21  
 Hovenweep National Monument, 5-52-B  
 Mesa Verde National Park, 8-50  
 Walnut Canyon National Monument, 8-24-A
- Cliff Palace**, Mesa Verde National Park, 7-\*95, 407
- Cliff swallows**, 4-†33 fol.
- Clifford, George**, and Linnaeus, 13-411
- Clifford, Margaret Rowe**, lyric to "Arizona" by, 8-24-A
- Cliffs, how formed**, 3-14  
 strata, 3-2

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Climate, influence on civilization, main article,**  
1-†193-97

affected by winds, 1-225

Africa, 5-473-A

Asia, 5-336-C

British Isles, 6-108-B

distinguished from weather, 1-193

effect upon costume, 9-12, 16

effect upon language, 10-3

effect upon trade, 7-571

**effect upon vegetation, 2-†192-97, 256**

Europe, 6-162-C

growing season determined by, 1-211

North America, 7-33-M

polar climate, 9-94-A

prehistoric, 1-196

Devonian period, 3-22

Eocene period, 3-51

Old Stone Age, 5-27, 28, 33

Pliocene period, 3-57

*see also Weather and also subhead climate under  
names of countries and states*

**Climbing fern, 2-90, \*91**

**Clinch River, U. S., 8-373**

**Clingman's Dome, mountain peak, 8-296, 373**

**Clinics for poor, 7-442**

**Clinton, De Witt, welcomes Washington, 7-\*181;  
8-169, 279**

**Clinton, George, vice president of the United  
States, 12-456-F**

**Clinton, Sir Henry, and Benedict Arnold, 12-487**

**Clio, muse, 14-412; 12-\*205**

**Cliona, boring sponge, 3-85**

**Clipper ships, 10-172, \*216, 223**

**Clitus, slain by Alexander the Great, 5-180**

**Clive, Robert, Baron Clive of Plassey, in India,  
5-381, 382**

opposing French leader, 6-80

**Cloaca Maxima, Roman sewer, 11-429**

**Cloak, costume, 9-12, †16**

**Cloak anemone, sea plant, 3-94**

**Cloak of Darkness, Siegfried's, 14-311, 314**

**Clocks, main article, 10-†461-68**

American colonial, 12-\*195

atomic, 10-\*466

Big Ben of Westminster, 10-\*465, 468

designs and decorations, 12-†193

forerunners, 10-†461-64

hands demonstrate angles, 10-438

invention and development, 10-†464-68

made by Christian Huygens, 13-377

made to glow in dark, 9-426

manufacturing centers, 8-104

mechanism, 10-†466-68

pendulum clock, 1-292; 13-377

periodic motion of pendulum, 1-\*288

sidereal or star clock, 1-186

telegraphic regulation, 10-99

telescope timed with, 1-186

water clocks, 10-†461, \*462; 12-27

clepsydra, 10-†461

*see also Watches*

**Clog, Japanese footwear, 9-\*54**

**Cloisonné enamel, 12-63 fol.**

**Cloister, architecture, 11-455, \*456**

**Cloister, of monastery, 11-477**

**Close, cathedral, 11-475**

**"Close of Day," painting by Jules Breton, 11-  
\*334**

**Closed shop, 7-563**

**Cloth, cotton, 9-29; *see also* spinning and weav-  
ing**

**Cloth Hall, Ypres, Belgium, 11-\*469**

**Cloth of Gold, Field of the, France, 6-\*44; 12-392**

**"Cloth towns," of England, spinning and weav-  
ing centers, 10-340**

**Clothes hanger, how to make, 14-†53**

**Clothespin people, how to make, 14-†7**

**Clothing, *see* Contents Volume 9**

camping garments, 14-550

Cro-Magnon man, 5-28, 30

difference between cotton and wool, shown  
under a microscope, 14-\*550

Egyptian, 5-49, 63

effect of tight clothing on breathing, 2-338

Eskimo, 7-\*36; 6-\*483

fashions in, *see* Costume

footwear, 9-†54-61

hats and other headdresses, 9-†88-95

healthful and sensible, 14-551; 2-418

light-colored, use in hot weather, 1-430

Scandinavians, early, 6-373

skins of prehistoric man, 5-24

woodsman, 14-†567

worn by divers, 10-522, 524

*see also fabrics used for, as Cotton; Leather; Silk*

**Clothing feathers, 4-12**

**Clothmakers' Guild, 5-310**

**Clotho, one of Fates, 14-412**

**Clotilda, Frankish queen, 5-291**

**Clotting of blood, 2-345, 348**

**"Cloud, The," by Shelly, 13-229**

**Clouded amber, 9-314**

**Clouded leopard, 4-292**

**Clouds, main article, 1-†234-37**

as weather prophets, 1-266

fog a cloud, 1-241

how caused, 1-235, 407

kinds, 1-†235-37

rain-bringing, 1-\*239, 245

thunderheads, 1-246, 249

use in rainmaking, 1-\*245, \*247, \*249

**"Clouds" in starry space (nebulae), 1-†182-83**

**"Clouds, The," by Aristophanes, 13-39**

**Clough, Arthur Hugh, Arnold's elegy on, 13-256**

**Clove carnation, flower, 2-230**

**Clover, vegetables, soil benefited by, 10-546**

**Cloves, spice, 9-†208-9**

**Cloves, oil of, 9-209**

**"Clovis," name, source of, 8-146-A**

**Clovis I, Frankish king, 5-†290-91**

adopts Christianity, 5-290; 6-166

first of Merovingians, 6-167

respect for Christian priests, 6-†164

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Clovis I—continued**

St. Genevieve rescues Paris from, 12-367  
 subdues Allemanni, 6-246

**Clowns**

circus, 12-†575, \*576  
 in "Commedia dell' Arte," 12-329

**Club car, 10-†197****Club mosses, plants, prehistoric, 2-†1**

Devonian period, 3-22

**Club steak, amount in steer, 9-328****Clubhouses, golf, 14-498****Clausius (Charles de l'Escluse), tulips bred by, 2-230****Clutch, automobile, how operated, 10-†289; 1-†318****Clutha River, on South Island, New Zealand, 5-541-B****Clyde, Firth of, Scotland, map, 6-575****Clyde River, Scotland**

map, 6-575

shipbuilding, 10-220

**Clymene, nymph, 14-†413****Clytemnestra, slays Agamemnon, 14-†452****Clytie, nymph, and Apollo, 14-441****"Clytie," statue by William H. Rinehart, 11-†373****Cnidus, Asia Minor, statue of Aphrodite, 11-†51, 52****Cnossus, ancient city, Crete, palace, 5-143 fol.; 11-416**

art, 11-†32-34

drainage system, 5-146; 11-416

excavation, 5-17, 143

legend of building of, 11-415

see also Crete; Labyrinth

**Cnut, see Knut the mighty, king of England and Denmark****Coach, vehicle, 10-†144 fol., †190; 7-†603**

motor bus, 10-†279, 281

passenger-airplane, 10-†321

**Coach dog, see Dalmatian****Coachella Valley, Calif., 8-40****Coahuila, state, Mexico, map, 7-596****Coady, Father, St. Francis Xavier University, Canada, 7-29-N****Coaita, monkey, 4-262****Coal and coal mines, main article, 9-†435-47**

bacteria aid production, 2-16, 20

by-products, 9-444, 445; 271-A, 271-B

cannel coal, 9-444

carbon dioxide produced by burning coal, 2-45

coal-tar products, 9-445, †446-47

coke, 9-445

competition with oil, 9-440

consumption by industry in the United States, 9-436

danger of gas explosion in mines, 13-383  
 early use, 9-435

exhaustion of supply, 1-352; 9-440

formation, 9-†435-38; 1-344, \*345

Carboniferous Period, 3-26, 27, †28

**Coal and Coal Mines—continued**

fossils in, 2-†2; 3-†29, 6

gas detection in mine, 9-†437, 443

gas manufacture, 9-444, †446-47

gases formed in burning of coal, 1-†534, 555

geologic eras found in, diagram, 1-40

grading, 9-443

importance to modern industry, 9-435-36

light energy stored in coal, 1-341

lignite, 9-438

method of burning, 10-334

mining, 9-†439, \*441, †442-45

automatic machinery and equipment, 8-†5; 9-†439, \*441, \*444

breaker house, 8-†411

peat, 9-437

plastics made from, 10-551 53

Pocahontas, 8-415

producing regions, 9-438

Europe, 9-438; 6-162-C

South America, 5-518 B

United States, 7-343-C, 343-E

Colorado, 8-50

Illinois, 8-103

Montana, 8-218

Ohio, 8-311

Pennsylvania, 8-337, 338

Utah, 8-395

Wyoming, 8-452

refining, 9-443, \*445

safety lamps for mines, 13-†383 84

varieties of coal, 9-438, 443

**Coal furnace, temperature, 1-†392****Coal gas, how produced, 10-†391**

danger to miners, 13-383

used for lights, 10-390

**Coal measures, how formed, 3-26, †28****Coal seams, 3-28****Coal State, nickname for Pennsylvania, 8-342****Coal strikes**

of 1902, 7-309

since World War, 7-333

**Coal-tar products, 9-307, †446-47; 10-547****Coaling stations along trade routes, 10-237, 238****Coalition ministry, England, 6-108****Coast Artillery, 7-478****Coast Guard, U. S., 10-†418; 7-†488-A-B**

Women's auxiliary organization, 6-†521

**Coast ranges, mountain ranges along Pacific**

coast, 7-33-M

Alaska, 8-16

California, 8-42

climate, 7-343-D

maps, 7-592, 594

Oregon, 8-324, 331

Washington, 8-428

**Coastal plains, see Atlantic Coastal Plain; Gulf Coastal Plain****Coasts, rising and sinking of, main article, 1-†69-72**

North American; danger points, 10-234

shores changed by earthquakes, 1-81

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Coat of arms**, 5-307; 10-354  
**"Coat of mail"** shell, 3-146  
**Coati**, animal, 4-324, \*325  
**Cobalt**, element, symbol, atomic no. and wt., 1-\*551; use, 9-403  
**Cobbett, William**, Federalist editor, 7-199  
**Cobbler**, making shoes, 9-†57, †59  
**Cobden, Richard**, 6-95  
**Cobego**, bat, 4-276  
**Coblentz, Doctor**, builds light-sensitive motor, 1-\*414  
**Coblenz (Koblenz)**, Germany, 10-257  
   map, 6-582, B3  
**Cobra** (hooded snake), 3 †485  
**Cobweb tangle**, game, 14-160  
**Cobwebs** of spider, 3-411  
**Cocaine**, drug, 2-395; 9-217  
**Cocci**, bacteria, 2-†14, 15  
**Coccygeal nerves**, 2-\*393  
**Cochet, Henri**, French tennis champion, 14-466, 470  
**Cochin**, breed of chicken, 9-\*350  
**Cochin-China**, republic in Indo-China, 5-429, 430, 430-B  
   map, 5-588  
**Cochineal**, is beet food of; dye from, 9-305  
**Cochlea of ear**, 2-\*282, \*284, \*304, 305  
**Cochlear canal**, 2-305  
**Cochrane, Thomas**, earl of Dundonald, 5-505  
**Cock, Captain Banning**, and company, in Rembrandt's "Night Watch," 11-\*275  
**Cock of the rock**, bird, 4-178, \*179  
**Cock Robin**, *see* Robins  
**Cockade State**, nickname for Maryland, 8-162-B  
**Cockatoo**, bird, 4-\*190, †192  
**Cockchafer**, beetle, 3-338  
**Cocker spaniel**, dog, 4-\*496, \*499  
**"Cockfight,"** painting by Gérôme, 11-\*338  
**Cockfighting**, 9-351, \*352  
**Cockle**, mollusk, 3-152  
**Cockleshell**, ornament, 12-190  
**Cockroach**, 3-355  
**Cockroft, Doctor**, experiments with atoms, 1-\*540  
**Cockscomb crab**, 3-183  
**Cocktail**, beetle, 3-337  
**Coco de mer**, palm, produces double coconut, 2-263  
**Cocoa**, how obtained, 9-178; *see also* Cacao tree  
**Cocoa butter**, 9-178  
**Cocoi herons**, birds, 4-\*102  
**Coconut**, double, 2-251, 263  
**Coconut crab**, 3-\*174  
**Coconut milk**, 8-470  
**Coconut palm**, description and uses, 5-526  
   importance to South Seas, 9-191  
**Coconuts**, 5-526; 9-204  
   float on water, 2-\*149, \*209, 212  
   seed, 2-\*118  
   shell insures dormancy, 2-219  
   transportation, 9-\*189  
**Cocoons**, zoölogy  
   ant, 3-321  
   ant lion, 3-384  
   bee, 3-299, 301, 313  
   buffalo gnat, 3-389  
   lacewing fly, 3-†382  
   moth, 3-288  
   silkworm, 3-\*289; 9-†36, †38-44  
   spiders, 3-\*408, †410  
   tiger moth, 3-\*270  
   wasp, 3-306  
**Cocopa Indians**, 7-†103  
**Cocos (Keeling) Islands**, group of coral isles in Indian Ocean, Southwest of Java, 5-430 B  
**Cocytus**, river, mythology, 14-407  
**Cod**, *see* Codfish  
**Cod, Cape**, peninsula between Atlantic Ocean and Cape Cod bay, Mass., name, 8-166  
**Cod liver oil**, vitamins in, 2-321; 3-211  
**Coda**, music, 12-236  
**Coddington, William**, American colonist, 8-344  
**Code**, semaphore, 14-†551  
**Code**, law, *see* Laws  
**Code**, telegraph, 10-†95-98, 99  
**Code Napoleon**, 7-355, 33-J; 12-432  
**Code writing**, main article, 14-†143-48  
**Codfish**, 3-\*211  
   eggs produced by, 3-208  
   importance to New England, 9-366  
   industry of Newfoundland, 7-†31 fol.  
   shoals in Norwegian fiords, 6-382  
   uses, 3-211  
**Codrington family**, Barbuda owned by, 7-63  
**Cody, William Frederick (Buffalo Bill)**, life, main article, 12-†573-74  
   friend of MacArthur family, 12-555-I  
   on the Pony Express, 10-89  
   portraits, 12-†573-74  
**Coefficient**, numerical, algebra, 10-433  
*Ceruleus*, *Gened*, 2-184  
**Coeur de Lion**, *see* Richard I, the Lion-hearted  
**Coffee**, main article, 9-†129-32  
   Arabian, 5-398  
   Brazilian industry, 5-513, \*514  
   caffeine, 9-132  
   Central American industry, 7-42, 46  
   coffee bean, 9-131; 2-\*124  
   Colombian industry, 9-†130, \*131  
   consumption in United States, 9-129  
   discovery; legends, 9-129  
   drink made of coffee leaves, 9-138  
   methods of cooking, 9-132  
   producing regions, 9-130  
   substitute, date seeds used as, 2-119  
**Coffee pots**, silver, 12-\*89, \*91  
**Coffeehouses**, 9-113, 129-30  
   as news centers, 10-74  
   London, 13-173; 9-130  
**Coffeepot**, game, 14-163  
**Coffer fish**, 3-207  
**Cofferdam**, in bridge building, 10-212

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Coffins, Egyptian**, 12-27, 80; *see also* Sarcophagus
- Cohen, Charles C.**, song by, 8-220-A
- Cohesion**, physics, 1-†359, 360
- Cohune**, oil, 9-190
- Coil**, electric, 1-†502, 506, 507
- Coil**, magnetic, 1-\*486, 487, \*489, \*490, 491
- Coimbra**, Portugal, description, 6-338  
university, 6-\*338
- Coignard, Abbé**, character, 13-137
- Coins and coinage**, 7-†502, †503, \*504, 506-7  
ancient, 7-†502  
copper, 1-379  
English coinage under Elizabeth, 6-53  
gold, why used for, 7-506  
amount of gold in, 9-396  
ancient, 7-502  
machine for making, 7-\*503  
value; use as standard, 7-507  
Greek, 11-†37  
invention, 7-502  
minting, 7-506  
not pure metal, 9-390  
old British pennies, 7-\*514  
Philadelphia mint; first coin struck, 7-\*514  
silver, 9-390; 7-502, 507  
substances used for, 7-502, 507  
tricks with, 14-†125  
*see also* Money
- Coke**, how made, 9-445  
used in iron smelting, 9-\*402
- Coking by-products**, 9-\*446-47
- Colbath, Jeremiah Jones**, *see* Wilson, Henry
- Colbert, Jean Baptiste**, Marquis de Seignelay, controls finances of France, 6-182; 12-411, 413  
portrait bust, 11-\*239
- Colborne, Sir John**, lieutenant-governor of Upper Canada, 7-18
- Colby**, Kansas, no taxes levied, 8-132
- Colby College**, Waterville, Maine, 8-149
- Colchicine**, in plant breeding, 2-\*226
- Colchis**, ancient country, Golden Fleece in, 14-449
- Colcock, Erroll Hay**, music to "South Carolina" composed by, 8-356-A
- Cold**  
caused by evaporation, 1-405, 408  
contraction due to, 1-†477-83  
effect upon molecular motion, 1-381  
sense of, regulated by skin, 2-293
- Cold**, common, deafness caused by, 2-304
- Cold and hot weather**, main article, 1-†206-11
- Cold light**, *see* Luminescence; Phosphorescence
- Cold-locker plants**, for cold storage, 10-519
- Cold region**, atmosphere, 1-\*454
- Cold Springs Bird Refuge**, 8-332
- Cold storage**, of food, 10-516, 518, 519; 9-357
- Cold storage plant**, 10-\*517, 518
- Cole, Thomas**, paintings by, 11-356
- Coleoptile**, of corn seed, 2-\*126
- Coleorhiza**, of corn seed, 2-\*126
- Coleridge, Samuel Taylor**, life and works, main article, 13-†217-18  
active in brilliant age, 6-86  
association with Wordsworth, 13-215, 216  
friendships, 13-219, 220, 224, 233  
portrait, 13-\*217  
quoted, 5-329  
"The Rime of the Ancient Mariner," 13-215, 218
- Colfax, Schuyler**, vice president of the United States, 12-456-F
- Colgate clock**, New York Harbor, 10-468
- Coligny, Gaspard de**, 6-177  
*see also* Huguenots
- Colima**, state, Mexico, map, 7-596
- "Collection of Ten Thousand Leaves"**, Japanese poems, 5-346
- Collective bargaining**, 7-541
- Collective farming**, Russia, 6-442
- College boat racing**, main article, 14-†530-33
- College Hall**, University of Pennsylvania, 8-\*334
- College of New Jersey**, former name of Princeton, 8-251
- Colleges and Universities**  
agricultural, 7-456  
first in America, 7-79  
first state universities, 7-243  
Indian and Negro, 8-417  
libraries, 10-556, \*559  
Phi Beta Kappa founded, 8-417  
teachers trained in monasteries, 5-278  
*see also names of colleges and universities, as, Harvard University; and also subhead education under states of United States*
- Colleoni, Bartolommeo**, Verocchio's statue of, 11-137, 144; 12-\*12, 22
- Collie**, dog, 4-\*498, 501; 9-\*78
- Collin, Jonas**, 13-85
- Collins, David**, portrait, 5-\*554
- "Collins"**, name for bread-and-butter letter, 13-208
- Collinsville**, Conn., 8-60
- Collodion**, used on negative, 10-67, 552
- Cologne**, Germany  
average January temperature, 6-241-B  
cathedral, 11-\*461  
reliquary, 12-66  
industry, 10-257  
map, 6-582, A3
- "Colomba"**, by Prosper Merimee, 13-131
- Colombe, Michel**, sculptor, art style, 11-105  
carving by, 11-\*92
- Colombia**, country, So. Amer. description, 5-517; general data, 5-518-E  
and Panama Canal, 7-48, 306  
area, 5-518-E  
climate, 5-518-E, 518-B  
communication, 5-517  
emerald mines, 5-500; 9-433  
flag, color plate, 14-following 570, no. 14  
government, 5-518-E  
hat making, 9-90

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Colombia—continued**

- history, 5-500, 505, 507, 517
  - Bolívar's war of liberation, 12-437
- Indians, 5-495
- location, 5-518-E
- map, 5-602
- Panama revolts from, 7-48
- people, 5-518-E
- physical features, 5-518-E
- products, 5-518-E; 9-†130, \*131
- provinces, 5-518-E
- resources, 5-517
- rivers, 5-518-E
- trade, 10-241
- woods, 5-518-E

**Colombo, Ceylon**

- coaling station, 10-237
- rainfall and temperature, 5-387-B
- unloading of tea in, 9-\*139
- tea export, 10-237

**Colon, Cristobal, see Columbus, Christopher****Colon (large intestine), 2-335, \*352, 358****"Colonel Graves," giant tree, 9-\*250****Colonial architecture, main article, 11-†501-8****Colonial glass, American, 12-†36-37****Colonial life, see American colonial life and history****Colonial National Historical Park, Va., 8-418-A****Colonial National Monument, 7-414****Colonization of America, main article, 7-†121-43; see also America, colonization****Colonna, Vittoria, and Michelangelo, 11-162****Color, 1-438-41**

- ability of eye to see, 2-299
- age of stars determined by, 1-173
- animals
  - birds' feathers lacking pigment, 4-188, 227
- changing
  - chameleon, 3-455, 462
  - fishes, 3-170, 204
    - cause, 3-205
  - Octopus, 3-169
- fishes, 3-\*126, 194, 196, 202 fol., 217
  - brightest in spring, 3-227
  - color plates, 3-198, \*214
- humming bird, 4-177
- sea creatures, 3-80, 100, 107, 135, 183
- tree frogs, 3-424
- architecture, Greek, 11-418
- art
  - Constable's use of, 11-316
  - designs woven in, 10-344
  - glass coloration, 12-30, 72, 74
  - Impressionists, 11-344-47
  - Indian basketry, 12-133
  - Persian, 11-29
  - Post Impressionists, 11-381, 383
  - pottery decoration, 12-46
  - Romanticists, 11-324
  - tapestry, 12-141
  - Turner's use of, 11-311, 314
- beauty, 9-304

**Color—continued**

- blood, 2-338, †344-47, 349
- camouflage, 1-440
- cause, 1-438, 439
  - butterfly wings, 3-281
  - due to wave lengths, 1-419, 438
  - water and snow, 2-15, 66
- changed by moving-picture camera, 10-509
- color plate, 1-†434
- complementary, *see below* primary and complementary
- Czechs' love of, 6-358
- flowers' use of, to attract insects, 2-163
- light, white, broken into, color plate, 1-\*435, 438
- light reflected or absorbed, 1-429, 430
- lighthouse signals, 10-229
- music, 12-237
- oriental rugs, 12-148, 150, 156
- photography, 10-503
- primary and complementary, color plate, 1-\*435, 440
- prism 1-199, 271
  - reflection and absorption, color plate, 1-434, 439, 440, 441
- rainbow, 1-187, 271
- spectroscopic analysis, 1-†187
- sunlight's effect on, 10-446
- symbolism, 12-157
- see also names of colors, as, Blue; Red; Yellow*
- "Color and excitement!"** battle cry of French Romantics, 11-326
- Color blindness, 2-299**
  - Dalton's studies, 13-383
- Color plates**
  - Aesop's Fables, 14-†256-308
  - American Indian, 7-frontispiece
  - Art, masterpieces of, 11-frontispiece, following, \*360, \*361; 7-\*29-I
  - birds, 4-†1, \*25, \*152, \*184, \*185
    - ducks and geese, 4-\*120
    - familiar gay-colored, 4-\*88, \*89
  - Canadian scenes, 7-†22, †23, \*29-I, †29-J
  - coal, 9-†435-47
  - color printing, 10-†64
  - cotton, 9-†28-31
  - costumes, 9-\*24, \*25
  - Diesel engines, 10-following \*174
  - fairy tales
    - Brother and Sister, 14-\*186
    - Brownies, 14-\*210
    - Cinderella, 14-\*248
    - Dame Holk, 14-\*199
    - Goose Girl, 14-\*231
    - Hansel and Grethel, 14-\*198
    - King Thrushbeard, 14-\*187
    - Little Red Riding-hood, 14-\*249
    - Piper of Hamelyn, 14-frontispiece, \*230
    - Seven Gallant Swabians, 14-\*211
    - Snow-white and the Dwarfs, 14-\*176
    - Snow-white and Rose-red, 14-\*177
  - flags of United Nations, 14-following 570

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Color plates—continued**

- gold, 9-†394-95
- how to make a sampler, 14-†76
- human body, 2-†frontispiece, †278, †279, †326, †327
- iron and steel, 9-†399-407
- insects, 3-†270
  - beetles, 3-†342
  - butterflies, 3-†278, †279
  - moths, 3-†294
- miscellaneous metals, 9-†417-21
- milk, 9-†331-38
- nursery rhymes, 14-†174-B-L
- petroleum, 9-†449-56
- plastics, 10-†542, †543
- planets, 1-†144, †145, fol. †152, †153
- precious stones, 9-†frontispiece
- rock strata and fossils, 3-†frontispiece
- sea life, 3-†86, †87, †142
  - fishes, 3-†198, †199, †214
  - shells, 3-†142
- solar system, 1-†98
- spectrum, 1-†187, †435
- star maps, 1-†178-A-L
- volcano, 1-†frontispiece
- see also*, Maps
- Color printing**, process, 10-†59, color plate, †64
  - William Blake's method, 13-212
- Color sphere**, of sun, 1-118
- Color vision**, 1-†438-41
- Colorado, state, U. S., description and history**,
  - main article, 8-†46-52; general data, 8-52-A-53
  - agriculture, 8-†50-51
    - cornfield, 9-†105
  - American Dust Bowl, 7-466
  - area, 8-52-A
  - Bryce Canyon, 1-†38
  - charities and correction, list, 8-52-A
  - cities, towns, list, 8-48, †49, 50, 51-52, 53
  - cliff dwellings, 7-†95; 8-†50
  - climate, 8-52-A
    - simoon (dust storm), 1-232
  - districts, list, 8-53
  - education, 8-52
    - institutions of higher learning, list, 8-52-A
  - flag, 8-52-B
  - fossils found in, 3-15
  - Garden of the Gods, 1-†39
  - gold rush; the fifty-niners, 7-†276, 277
  - Great Dike, 1-†38
  - holidays, 8-52-B
  - included in Mormon state, 8-393
  - Indians, 7-93, †95; 8-48
    - modern, 8-43
    - reservation, 8-52-B
  - interesting points to see, 8-52; *see also below*
    - monuments; parks
  - location, 8-52-A
  - Long's Peak, 7-407, †408
  - map, 8-481
    - on United States map, 7-594

**Colorado, state, U. S.—continued**

- mining boom, 8-48, 50
- monuments, 8-52-B
  - Black Canyon National Monument, 8-52-B; 7-†418, 419
- motto, 8-52-B
- name, 8-52-B
- nicknames, 8-52-B
- parks, 8-52-B
  - Mesa Verde National Park, 8-52-B, †50; 7-407
  - Rocky Mountain National Park, 8-52-B 7-407, †408
- physical features, 8-52 A, 46
- Pike's Peak, 8-47, 48; 2-†187
- political facts, 8-52-A
- products and industries, 8-†48-52
- ranges, 8-†46
- reservations, game and bird, 8-52-B
- ivers, 8-52-A
- state bird, 8-52-B
- state flower, 8-52-B
- state song, 8-52-B
- Colorado, University of**, 8-†47
- Colorado beetle**, 3-338, †339; 9-33
- Colorado Desert**, Calif., 1-†95; 3-456, 457
- Colorado National Monument**, 8-52-B
- Colorado Plateau**, Colorado and Utah, 7-343-10; 8-396
- Colorado River**, Texas, 8-386
- Colorado River**, U. S., 8-24, 52-A, 396
  - California, 8-42
  - dam at Yuma, 8-24
  - Grand Canyon, *see* Grand Canyon
  - Hoover Dam, 8-234, †22; 10-†51, †532; 1-370
  - map, 7-594
  - name, 8-52-B
  - Nevada, 8-234-A
  - Rock Island Dam, 8-428-A
  - water used for irrigation, 8-24, 40
- Colorado River Aqueduct**, 10-206
- Coloration**, protective, *see* Protective devices
- Colored glasses**, 1-439
- Colossal**, origin of word, 5-187
- Colosseum**, building, Rome, 11-†432 fol. arena, 5-†251
  - building of, 5-238
  - Fascist meeting in, 6-†311
- Colossus, Egyptian**, 5-†68
- Colossus of Rhodes**, 5-†186, 187; 6-478; 11-55
- "Colossus of the North"** (United States), 5-518
- Colt, Samuel**, 8-56
- Colter, John**, 7-404-5
- Columba, Saint**
  - founds monastery at Iona, 6-9, 146, 487, 488
  - in art, 11-†83, 84
- Columban**, Irish monk, converts Allemanni to Christianity, 6-246
- "Columbia," yacht**, 14-530
  - see also* Yachting

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



- Columbia, District of, U. S.,** *see* District of Columbia
- Columbia, Mo.,** university at, 8-208
- Columbia, S. C.,** 8-355  
State Capitol, 8-\*349  
\*textile industry, 8-\*353  
university at, 8-350
- Columbia, District of, U. S.,** 7-118-D
- Columbia Basin,** deserted houses, 7-465
- Columbia Fur Company,** scouts sent out, 8-299
- Columbia Plateau,** United States, 7-343-D
- Columbia River, North America,** 8-331; 7-33-A  
apple orchards along banks, 9-163  
basin area, 10-257  
discovery of mouth, 13-492  
fisheries in, 9-364, 366  
Grand Coulee Dam, 8-428  
irrigation dams, 8-329, 428  
joined by Snake River, 8-449  
Lewis and Clark expedition, 13-492; 7-†207, \*209  
map, 7-594  
name, 8-332  
Oregon, 8-325  
salmon fisheries, 8-328  
Washington, 8-428
- Columbia River Bird Refuge,** 8-428-A
- Columbia River Plains,** Washington State, 8-428
- Columbia River Valley,** dry farming, 7-456
- Columbia University,** in New York City, 12-508  
Eisenhower president of, 12-555-G  
first library school, 10-561  
library, 10-†559  
music department organized by Edward MacDowell, 12-322
- Columbine,** comedy character, 12-329
- Columbine,** Colorado's state flower, 8-52-B
- Columbus, Christopher, life,** main article, 13-†447-55  
aided by Ferdinand and Isabella, 13-450; 6-323  
Amerigo Vespucci and, 13-457  
at Salamanca, 7-\*113  
books of, 10-51  
"Colon" a form of name, 10-51  
death and burial, 13-\*454, 455  
flag, 14-573  
Porto Rico visited, 8-469  
portrait, 13-†447  
ship, 13-450; 10-\*158  
statue and sarcophagus at Santo Domingo, 7-\*58  
takes rubber balls to Spain, 9-261  
treatment, by Spain, 13-452, \*454; 7-114, 116  
voyages and discoveries, 13-†450 fol.; 7-†113-16  
America, 13-450; 7-115  
South America, 13-452; 5-496  
Virgin Islands, 7-62  
West Indies, 7-50, 53, 54, 55, 57
- Columbus, Diego**  
and Christopher Columbus, 13-448, \*449  
founds settlement in Jamaica, 7-54  
"Columbus," packet ship, 10-173
- Columbus, Ga.,** industries and commerce, 8-83
- Columbus, Ohio,** 8-304, 311  
housing unit, 6-\*561
- Columbus Day,** 7-114; 14-586
- Column, architecture,** 12-\*94  
Doric, development shown at Heraeum, 5-167  
Lincoln Memorial, 11-\*521  
early Christian churches, 11-†75-76  
Egyptian, 11-\*411, 413  
Greek, 5-158; 11-†418  
Roman, 11-†432, \*437  
to Marcus Aurelius, 11-\*434  
to Trajan, 12-\*104  
Syrian, in Venice, 11-\*487  
twisted, 11-\*456
- Colville River,** Alaska, 8-16
- Coma,** in plants, 2-207
- Coma,** of comet, 1-162
- Coman, Marc de,** tapestry works, 12-143
- Comanche Indians,** Oklahoma land grant, 8-317  
Houston's relations with, 12-516
- Comayagua,** plain, Central America, 7-48-A
- Comb,** of chicken, 9-352
- Comb jellies,** jellyfish, 3-113
- Combahee River,** South Carolina, 8-356
- Combinations and monopolies in business,** 7-541
- Combustion,** 1-384  
conditions necessary for, 1-†373, 384  
Lavoisier explains, 1-373  
spontaneous, 1-384, 385
- Combs**  
Chinese, 12-\*125  
synthetic camphor use in, 10-562
- Comédie Française,** Voltaire attempts reform, 12-351
- Comedies**  
American, 13-355  
English, sentimental, 12-331; 13-180  
Greek  
actor's costumes, 12-325  
Aristophanes, 13-39  
Euripides, 13-38  
Italian, 12-328
- Comedies of manners,** written in prose, 12-331
- "Comedy of Errors,"** by Shakespeare, 13-157
- "Comet,"** steamboat, 10-\*219, 220
- Comets,** 1-†161-65, 167  
composition: orbit, 1-162  
Halley's comet, 1-\*162, †163, 13-†402  
most famous, 1-†163, 167
- Comic strip of ancient Greeks,** 5-158
- Comitia centuriata,** Roman assembly, 5-201
- Comitia tributa,** Roman assembly, 5-201
- Commandos,** 7-493
- "Commedia dell'Arte,"** 12-328  
Goldoni attempts reform, 12-331
- Commerce,** tapestry symbolic of, 12-\*143; *see also* Trade

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Commerce, Department of, U. S.,** 7-380, 381  
 airplane numbers assigned by, 10-\*327  
 building, Washington, D.C., 7-\*575  
 Census, Bureau of, 7-†379, 381  
 Fisheries, Bureau of, 9-365  
 flag of Secretary, color plate, 14-facing \*571  
 Patent Office, 7-381  
 Weather Bureau, 7-380

**Commerce Building,** Washington, D. C., 7-\*375

**Commercial associations,** *see* Guilds; Hanseatic League; Labor Unions

**Commercial Pacific Cable,** relay station at Wake Island, 8-464

**Commission form of government,** 7-392

**Commode, Adam style,** 12-\*191

**Commodus, Roman emperor, statue,** 11-\*66

**Common, land, in Middle Ages,** 5-302

**Common law, explained,** 7-386

**Commons, House of**

beginnings, 6-25

Great Protestation, 6-60

hourglass used in, 10-462

in fifteenth century, 6-37

*see also* Parliament, British

**Commonwealth, in England,** 6-68; 12-409

**Commonwealth of Nations,** *see* British Commonwealth of Nations

**Commune of Paris,** 1-356; 6-200

**Communes, organized by Louis VI,** 6-171

**Communication, main article,** 10-†1-126 (*see also* Contents Volume 10 for chapter headings and main subjects listed below)

**cables,** 10-†101-6

carrier pigeons, 10-32

chemistry's contributions, 10-549

deaf and dumb alphabet, 10-\*6

early methods, 10-†27-32

importance to progressive nation, 10-92

language, 10-†1-25

modern efficiency due to electricity, 1-513

news: how procured, 10-78

newspapers, 10-†73-82

post office, 10-†84-92

printing, 10-†47-71

Braille for blind, 10-60, †62

radio, 10-†115-21

runners, 10-30-31

sign language, 10-28

signals, *see* Signals

speeded up by invention, 10-76, 78, 91, 95

telegraph, 10-†94-99

telephone, 10-†108-13

telephone combined with radio, 10-121

teletype machine, 10-\*99

television, 10-†123-26

town crier, 10-\*73

writing, 10-†34-45

*see also* Transportation

**Communism,** 7-551, 556

Balkans, 6-363, 364, 368

China, 5-335; 6-564

Hungary, 6-290

**Communism—continued**

Inca empire, 7-92

Italy, 6-310, 312

Russia, 6-†439-43; 12-449-F

Russian Turkestan, 5-435

*see also* Socialism

**Communist (Third) International, founded by**  
 Lenin, 6-442

**Community**

American Indian, 7-†88-108

city government, 7-†390-402

city planning, 7-†445-48

colonial, *see* American colonial life

medieval, 5-†300-11

postal service, 10-†84-92

prehistoric, 5-†23-40

social welfare, 7-†422-44

*see also* Communication; Transportation

**Community centers,** 7-\*443

**Community dwellings, pueblo ruins,** 8-50

**Commutator of dynamo,** 1-†502, 507

**Como, Lake, Italy, map,** 6-585

**Compact of Mayflower Pilgrims, signing,** 7-\*127

**Company, business organization,** 7-523

**Company, in U. S. Army,** 7-479-E

**Company union,** 7-563

**Comparative anatomy,** *see* Anatomy, animals

**Compartment, Pullman train,** 10-193

**Compass, use in geometry,** 10-438, \*439

**Compass, main article,** 10-†454-57, \*439

gyrocompass, 1-\*291; 10-457

importance in pathfinding, 14-562-64

in ancient China, 1-485

magnetic needle, 1-488

pocket, 14-\*566

radio, 10-121

Thomson compass, 13-392

**Competition, economics**

and monopoly, 7-539, 541

effect on prices, 7-538

**Compiègne, Battle of,** 12-390

**"Complaint of Chaucer to His Empty Purse, The,"** by Chaucer, 13-143

**"Compleat Angler, The,"** by Izaak Walton, 13-165, 166

**Complementary colors,** 1-440

**"Complete Letter Writer,"** Samuel Richardson's contributions to, 13-186

**"Complete Poems,"** by Emily Dickinson, 13-323

**Complexion of skin,** 2-288

**Compoboard,** 9-294

**Composers, musical,** *see* Musicians

**Compositae, plant division,** 2-\*170, \*173-74, 175

**Composite Order, architecture,** 11-432

**Composition, typography,** *see* Typesetting

**Compositor's stick, typesetting,** 10-†60

**Compostela, Spain,** *see* Santiago de Compostela

**Compound bar**

oven thermometer, 1-391

refrigerator, 1-410

thermostat, 1-\*480, 481

**Compound leaves,** 2-24

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Compound microscope**, 10-†486
- Compounds, chemical**, main article, 1-†550-58  
   defined, 1-282, 357  
   formation from elements, 1-†544, 545  
   • law of definite proportions, 1-553, 555, 557  
   uses, 10-544
- Compressed air**, industrial uses, 1-460-62  
   danger of working in, 1-461  
   use in measuring blood pressure, 1-462  
   use in tunnel building, 10-207
- Compressed-air brakes**, 1-†461, 462; 10-200
- Compressed-air hammers**, 1-†462, 479
- Compression**, physics, gases changed into  
   liquids by, 1-†405
- Compression stroke**, of automobile, 10-†282
- Compromise of 1850**, 7-247; 12-519
- Comstock Lode**, mine, 8-232
- Comstock mine**, Nevada, 9-388
- "Comus,"** by Milton, 13-167
- Comyn, John** (the Red), and Robert Bruce,  
   6-114; 12-382
- Cona**, bird, 4-†178
- Concave lenses**, 1-431, †432
- Concentrated milk**, 9-338
- Concentric spheres**, Chinese carving, 12-98
- Conceptions**, psychology, defined, 13-8
- "Concerning Germany,"** by Madame de Staël,  
   13-122
- "Concert, The,"** painting by Titian and Giorgione,  
   11-177, \*178
- Concert master**, music, 12-258
- Concerto**, musical composition, 12-234
- "Conciliation with America,"** Burke's speech  
   on, 13-201
- Conconully Bird Refuge**, 8-428 A
- Concord, Mass.**  
   Alcott home, 13-320  
   literary center, 13-305  
   Old Manse, 13-304  
   statue of "Minuteman," 7-†160
- Concord, N. H.**  
   temperature, 8-242-A
- Concord, Battle of**, 7-†163, 164
- Concord, temple of, Rome**, 5-†231
- "Concord Hymn,"** by Ralph Waldo Emerson,  
   quoted, 13-305
- Concordat**, of Napoleon, 6-194
- Concrete**, how made, 9-382  
   reinforced concrete, 11-518  
   bridges, 11-212  
   buildings, 9-382  
   Roman architecture, 11-428, 431  
   skyscraper construction, 11-518
- Concrete pavements**, expansion and contraction,  
   1-†476, 479
- Concrete roads**, 10-†155, 156
- Condé the Great**, Louis II de Bourbon, Prince  
   at Lens, 6-†183  
   victories won for Louis XIV, 12-411
- Condensation of gases**, 1-406
- Condensation of water vapor**, 1-235, †239-41
- Condensation point**, 1-240
- Condensed milk**, 9-338
- Condenser**, in gas refrigerator, 1-†409, 410
- Condenser**, in radio, 10-†121-M-21-O
- Condenser**, in steam engine, 10-401
- Condiments**, 9-310; *see also* Seasoning
- Condors, birds**, 4-†159, \*161, 162, \*11  
   prehistoric period, 3-†49
- Conduction**, physics  
   electricity, *see* Electricity  
   heat, *see* Heat
- Cone**, of Volcano, 1-frontispiece
- Cone shell**, 3-144
- Cones of evergreens**, 2-†94, †95, \*96  
   gathered for edible seed, 2-†97
- Cones of eye**, 2-298
- Conestoga wagons**, 10-148, \*190
- Coney**, small animal, *see* Cony
- Coney fish**, 3-†113
- Confectionery**, *see* Candy
- Confederate States of America**, 7-†252, 255-65  
   capital, 8-412  
   causes and events leading to formation, 7-241  
   Europe's attitude, 7-258  
   Houston's attitude, 12-516  
   Jefferson Davis elected president, 7-250  
   Lee, 7-258 fol.; 12-526  
   Lincoln's attitude toward, 12-532  
   navy, 7-482  
   Tennessee's contributions to cause, 8-370  
   *see also* Civil War
- Confederation, Articles of**, 7-175, 179, 362
- Confederation Chamber**, Canada, 7-†33-D,  
   29-M
- Confederation of the Rhine**, 6-224
- "Confessions,"** by Rousseau, 13-19
- "Confessions" of Saint Augustine**, 13-531
- "Confessions of an English Opium Eater,"** by  
   De Quincey, 13-233
- Confucianism**, 5-319; 13-515
- Confucius**, Chinese philosopher, life and teachings,  
   main article, 13-†514-16  
   examinations based on Five Classics of, 5-  
   319, 320  
   "Five Relations," 5-319  
   painting by La Farge, 13-†514
- Congaree River**, South Carolina, 8-356
- Conglomerate rocks**, 1-54
- "Congo,"** trained elephant, 4-340
- "Congo, The,"** by Vachel Lindsay, 13-350
- Congo Basin**, Africa, 5-473-A
- Congo Free State**, Africa, *see* Belgian Congo
- Congo River**, Africa, 5-467  
   basin area, 10-257  
   Congo country and its people, 5-†476-70  
   length, 10-253  
   map, 5-576
- Congregational church**, 8-171
- Congress, Library of**, 10-†555, 561
- Congress Hall**, Philadelphia, 7-†356
- Congress of Bards**, 6-†136, 139, \*140, 141
- Congress of Industrial Organizations**, 7-563

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Congress of U. S.**, *see* United States government and politics, Congress
- Congress Poland**, 6-154
- Congresses**, lawmaking bodies, 7-357
- Congressmen of U. S.**, how chosen, 7-363, 367
- Congreve, William**, comedies written by, 12-331
- Congruent figure**, geometry, meaning, 10-437
- Conies**, rock rabbits, 4-†345
- Conifers, evergreen trees**, main articles, 2-†94-99, \*266-69  
first appearance, 3-53  
*see also* Evergreen trees
- "Coningsby,"** by Disraeli, 12-441
- Connacht**, Irish kingdom, 6-144
- Connaught tunnel**, Canada, 10-206
- Connecticut**, state, U. S., description and history, main article, 8-†55-61; general data, 8-62-62-A  
agriculture, 8-58  
area, 8-62  
"Blue Laws," 8-56, 62  
capital and capitol building, 8-\*55  
charities and correction, 8-62  
charter, 8-\*56-57; 7-126, 128  
churches, 8-\*60  
cities, towns, list, 8-62-A  
manufacturing, 8-60  
climate, 8-62, 58  
counties, list, 8-62-A  
education, 8-61  
institutions of higher learning, list, 8-62  
flag, 8-62  
history, 8-56-58  
colonized, 8-56; 7-126  
emigration to Vermont, 8-399  
Ohio land, 8-306  
signs Declaration of Independence, 7-173  
Wyoming Valley claimed, 8-336  
holidays, 8-62  
Indians, 8-57-58  
inventors and inventions, 8-56  
location, 8-62  
map, 8-483  
on United States map, 7-595  
motto, 8-62  
name, 8-62  
nicknames, 8-62  
oyster beds menaced by starfish, 3-132  
physical features, 8-62, 58  
political facts, 8-62  
products and industries, 8-58-61, 55  
tobacco, 9-\*222, 223  
rivers, 8-61  
state birds, 8-62  
state flower, 8-62  
state song, 8-62
- Connecticut River**, New England, 3-62, 242-A  
Massachusetts, 8-176  
Vermont, 8-404
- "Connecticut State Song,"** song, 8-62
- Connecticut Valley**, farming, 8-57
- "Connecticut Yankee in King Arthur's Court, A,"** by Mark Twain, 13-330
- Connecting rod**, Diesel engine, 10-\*276
- Connective tissue**, anatomy, 2-290
- Connelly, Marc**, dramatist, 13-355
- "Connor, Ralph,"** Canadian author, 7-29-1
- "Conquest of Granada, The,"** by John Dryden, 13-174
- "Conquest of Granada, The,"** by Washington Irving, 13-294
- "Conquistador,"** poem by MacLeish, 13-354
- Conquistadors in South America**, 5-497-501
- Conrad I**, king of Germany, 6-208
- Conrad, Joseph**, life and works, main article 13-†273-74  
portrait, 13-\*273
- Conradin**, last of the Hohenstaufens, death, 6-209, 299; 5-299
- Conroy, Jack**, novelist, 13-355
- "Conscious Lovers, The,"** by Sir Richard Steele, 13-180
- Conscription**  
Canada, 7-29  
Civil War, 7-262  
World War, 7-322
- Conservation**  
canyons, cliff dwellings, 7-†416-21  
health  
first aid, 2-†399-412  
public health, 7-423  
Red Cross, 7-†425-31  
rules for right living, 2-†414-21  
welfare work, 7-433-44  
*see also* Public safety  
natural scenery; national parks, 7-†404 9; 1-36  
time and human energy, 7-496-500  
wild life, 4-516; 7-405  
Alaska, 8-16-A, 16-B  
birds, 4-†516-18; 13-428  
buffalo, 7-279  
fish, 9-368  
seals, 4-331  
*see also* subhead reservations, bird and game  
*under individual states*  
*see also* Conservation of natural resources
- Conservation of energy**, law of, 1-350, 351
- Conservation of matter**, 1-283  
discovered by Lavoisier, 13-381
- Conservation of natural resources**, main article, 7-†465-70  
C. C. C. camps, 7-\*469, 470  
coal production, 9-440  
commissions appointed, 7-467  
Indiana, 8-115  
Maine, 8-153  
Muir's influence, 8-42-B  
national parks, description of, 7-†404-9  
overproduction of oil, 9-449  
Pennsylvania, 8-339  
possibility of chemistry finding substitutes, 10-550  
reforestation, 2-†240-47; 9-\*257

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Conservation of natural resources--continued**

- soil, 2-241 fol.; 7-†465 fol
- TVA project, 8-372, 368
- waste of West Virginia's early days, 8-435
- Theodore Roosevelt's work, 7-\*309, 310, \*311
- see also* By-products; Reforestation

**Conservative**, political meaning of, 7-335**Conservative party**

- Canada, 7-25, 26, 29
- England, 6-95; 12-449-B-449-C
- Mexico, 7-84

**"Consolation of Philosophy,"** work by Boethius, 13-58**Console**, of organ, 12-258 D**Constable, John**, life and art, 11-304, \*314, †315-18

- eulogy on a tree, 11-316
- influence upon French Romantics, 11-322, 326
- opinion of Gainsborough's landscapes, 11-304
- paintings

"Salisbury Cathedral," 11-\*315

"The Hay Wain," 11-\*314, 322, 325

**Constance**, wife of Emperor Henry VI, 5-298**Constance, Princess**, in "Canterbury Tales," 14-†332-35**Constance, Lake of**, Europe, map, 6-585**Constance, Council of**

- decides succession of popes, 6-300
- John Huss's trial, 13-\*536, 537

**Constance, Peace of**, 5-298**Constantine I, the Great**, emperor of Rome.

- life, main article, 12-†364-65
- baptism, 12-\*364
- Byzantium made capital, 12-365
- Christianity adopted as state religion, 12-365; 5-253; 11-78
- empire established by, 5-288
- portrait bust, 12-\*365
- statue, 5-\*221
- vision of the cross, 5-\*250; 12-364
- depicted in painting, 11-142

**Constantine, Arch of**, Rome, 11-\*435**Constantinople**, Turkey (official name Istanbul), description and history, 5-†405 fol

- art treasures taken by crusaders, 12-86
- besieged by Saracens in 718, 5-406
- captured by Turks in 1453, 5-411
- Golden Gate, 5-\*404
- library, 10-556
- mosques, 5-\*403
- St. Sophia, 11-81, \*445, 446, 5-405; 12-86
- named after Constantine, 5-288
- period of glory, 5-407
- Russian efforts to obtain, 6-436
- sacked by Crusaders, 5-409
- threatened by Seljuk Turks, 5-408
- trade, 5-407, 412
- see also* Byzantium; Istanbul

**Constantinople, patriarch of**, leader of Eastern church, 5-275**"Constellation,"** air liner, 7-\*500**"Constellation,"** ship, 7-203**Constellations**, astronomy

- division of stars into, 1-177
- names, 1-\*170, 177, 204
- star maps, color plates, 1-178-A-178-L
- stories of, in Greek mythology, 14-†425-32
- see also* Stars

**Constitution**, *see* Constitutions and constitutional government**Constitution, U. S.** *see* United States Constitution**"Constitution,"** U. S. frigate, 7-203

- celebrated in poem, "Old Ironsides," 13-309
- fight with "Java," 7-\*210
- War of 1812, 7-\*202

**Constitution Act**, New Zealand made separate colony by, 5-537**"Constitution of the United States, The,"** painting by Faulkner, 12-†496**Constitution State**, Connecticut, 8-62**Constitutional convention**, U. S., 7-179, 362**Constitutional monarchy**

- Denmark, 6-416-B
- Persia, 5-106
- Siam, 5-430-A
- Spain, 6-333
- Yugoslavia, 6-290-B

**Constitutional Society**, England, 13-379**Constitutional Union Party**, U. S., 7-250**Constitutions and constitutional government**, 7-356-59

reason for, 7-348

*see also* subhead political facts under states, and also United States Constitution

**Constitutions of Clarendon**, laws drawn up by Henry II of England, 6-21**Constrictor snakes**, 3-†494**Construction**, *see* Building construction; things to make**Consular officers**, U. S., 7-374

service reorganized, 12-456-B

**Consuls, government by**, under Napoleon, 6-194**Consuls, Roman**, 5-199; 7-348**Consumer**, economics, 7-570**Consumer Coöperation**, 7-552**Consumption** (tuberculosis)

- bacilli of, 2-13 fol.
- fight of blood and lymph against, 2-†347

**Contagion**, germs the cause of, 2-†349**Contagious diseases**, *see* names of diseases, as Typhoid fever; Smallpox; and also Inoculation; Vaccination**"Contemplations,"** by Victor Hugo, 13-125**Contentnea Creek**, Battle of, 8-288**"Contes,"** by La Fontaine, 13-115**Continental army**, U. S., Washington in command of, 12-476**Continental code**, telegraph code used in Europe, 10-\*97**Continental Congress**, 7-164, 167

- adopts flag of United States, 14-575
- Indiana territory captured for, 8-111
- limited powers, 7-175

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Continental Congress**—*continued*  
 naval force organized by, 7-481  
 raises colonial army, 7-472  
 Second, date of, 8-277  
 sends armies to invade Canada, 7-12  
 signing of the Declaration of Independence, 12-\*505  
 Thomas Jefferson and, 12-504  
 treatment of Benedict Arnold, 12-487  
 Washington's struggle with, 12-476  
**Continental or great divide**, 8-220, 454  
 New Mexico, 8-262  
**Continental money**, 7-167  
**Continental shelf**, of ocean, 1-69; 9-364  
**Continents**  
 lifting and sinking of coast lines, 1-†69-72  
 lost, 3-35; 5-444  
*see also names of continents*, Africa; Asia; Europe; North and South America  
**Continued story**, game, 14-163  
**Continuous spectrum**, 1-187  
**Contour planting**, 9-\*26  
**Contra-bassoon**, musical instrument, 12-258-A  
**Contractile vacuole**, in animal cell, 2-\*280  
**Contraction of matter**  
 air, 1-483  
 metal, 1-477, 478  
 rocks, 1-41  
 water and liquids, 1-482  
**Control force**, U. S. Navy, 7-486  
**Control Room**, radio, 10-121-D  
**Convection of heat**, 1-†398  
**Conventicles**, Scotland, 6-127, \*128  
**Conventions**, political, 7-\*369  
**Converters**  
 copper refining, 9-\*417  
 in steel making, 9-\*403  
**Convex lens**, 1-431, †432  
 used in camera, 1-†433  
**Convict colonies in Australia and Tasmania**, 5-545 fol.  
**Conway Castle**, Wales, 6-\*138; 11-\*477  
**Cony**, small animal, 4-\*345  
**Cook, Frederick A.**, Arctic explorations, 13-501  
**Cook, James, Captain**, life and explorations, main article, 13-†488-90  
 Alaskan explorations, 8-12  
 Antarctic explorations, 13-489, 506  
 Australian voyage, 13-\*488; 5-\*543  
 death, 13-†490  
 discovers Hawaii, 13-†490; 8-458  
 New Zealand visited, 13-489; 5-532  
 North American shores visited, 7-\*18, 19  
 portrait, 13-\*489  
 prevents scurvy among crew, 2-363  
**Cook, Joseph**, Australian premier, 5-560-A  
**Cook, Mt.**, highest peak of Southern Alps, 5-541-B; 1-29  
 map, 5-599, C5  
**Cook County**, Ill., 8-106-A  
**Cook (Hervey) Islands**, So. Pacific Ocean, 5-528  
**Cook Strait**, New Zealand, map, 5-599  
**Cooke, Jay**, 7-282  
**Cooking**  
 by cave man, 5-29  
 candy recipes, 14-83-86  
 coffee, 9-132  
 in baskets, 12-132  
 in camp, 14-\*553, 556  
 probable origin, 10-331  
 soybean recipes, 9-214-A, 214-B  
 utensils, 12-\*16, \*17, 132  
**Cooks**, in Augustan Age, 5-229  
**Cookworthy, William**, 12-61  
**Coolidge, Calvin**, president of U. S., 12-456-B; 7-332  
 history written by, 8-364-A  
 portrait, 7-\*334  
 vice-presidency, 12-456-F  
**Coolidge, Grace Anna Goodhue** (Mrs. Calvin Coolidge), 12-564  
**Coolidge Dam**, Arizona, 10-\*531  
**Coolie**, oriental laborer, 5-\*384  
**Cooling system of automobile**, 10-†286  
**Coons**, *see* Raccoon family  
**Coonskin Library**, Ames, Ohio, 10-557  
**Coontie**, cycad plant, 2-90  
**Cooper, James Fenimore**, life and works, main article, 13-†295-97  
 portrait, 13-\*296  
**Cooper, Myles**, president of King's College, 10-559  
**Cooper, Peter**  
 builds the "Tom Thumb," 10-183  
 portrait, 10-\*101  
**Coöperative associations**, 7-460  
 Denmark, 6-416-B  
 Finland, 6-464-B  
 Minnesota, 8-197  
**Coöperative Commonwealth Federation**, Canada, 7-29-B  
**Coöperative Movement**, 7-552-54  
**Cooper's Creek**, Australia, 5-\*553  
**Cooper's hawk**, 4-153  
**Coosa River**, U. S., 8-2, 3, 8  
**Coosa Valley**, 8-2  
**Cooter**, terrapin, 3-474  
**Coots**, birds, 4-109, 110, 175  
**Copalis Rock Bird Refuge**, 8-428-A  
**Copeland steam tricycle**, 10-\*280  
**Copenhagen**, Denmark  
 attacked by Sweden, 6-402  
 built by Absalon; meaning of name, 6-410  
 fire in, 6-415  
 location by Lat. and Long., 6-416-B  
 modern apartment house, 6-\*416-A  
 rainfall, 6-416-B  
 surrender to English navy, 6-416  
**Copenhagen, Battle of**, 1801, 12-422  
**Copenhagen, University of**, rebuilt, 6-415  
**Copernican system and Galileo**, 13-397  
**Copernicus, Nicolaus**, life and work, main article, 13-†393-94  
 astronomical theories, 1-100, 103

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Coping saw**, how to use, 14-†26
- Copland, Aaron**, 12-257
- Copper**, element, 9-419
- bronze contains, 12-12
  - coins contain, 7-507
  - etching, 10-64, †65
  - electrical resistance, 1-515
  - electrochemist alters, 10-545
  - electrotyping, 10-57
  - engraving, 10-62
  - early use of, 12-12, 14
  - German silver contains, 9-420
  - gold mixed with, 9-396
  - largest statue ever cast in, 5-346
  - melting point, 1-†392
  - mines, 9-†416, †419, †421, 8-†23
  - molecules, 1-379
  - necessary to plants, 10-546
  - New Jersey refineries, 8-249
  - photo-engraving, 10-†68, †69
  - producing regions, 9-419
    - Canada, 7-29-Q, 29-U
    - South America, 5-518-B
    - United States, 7-363-C, 363-E
      - Michigan, 8-185
      - Monte., 8-217, 218
      - Nevada, 8-†233
      - Utah, 8-394
  - refining, 9-†416; 1-†379
  - silver mixed with, 9-389, 390
  - symbol, atomic no. and atomic wt., 1-†551
  - unsmelted, 12-13
  - use in electric cell, 1-496, †497
  - wire, conduction of electricity, 1-515
- Copper beech**, tree, 2-160
- Copper butterfly**, 3-282
- "Copper City,"** 8-281
- Copper mining**, 9-†419, †421
- Copper plate engraving**, 10-62
- Copper plate etching**, 10-64, †65
- Copper (Atna) River**, Alaska, 8-16
- Copper State**, nickname for Wisconsin, 8-446-A
- Copper sulphate**
- used in spray solutions, 2-139, 140
  - water purification by, 10-542
- Copperhead**, snake, 3-492, †501
- treatment for bite, 2-108
- "Copperhead, The,"** drama by Augustus Thomas, 13-354
- Copperheads**, Southern sympathizers in Civil War, 7-262
- Coppermine River**, Canada, Hearne reaches mouth, 13-497
- Copra**, kernel of coconut, 5-526
- oil from, 2-129; 9-190
- Coprinus bulbosus***, mushroom, 2-†73
- Coptic Christianity**, 5-73, 460
- Coptic script on Rosetta Stone**, 10-†41
- Copyright Office**, in Library of Congress, 10-555
- Copyright system**, U. S., 7-381
- Coral**, main article, 3-†97-102
- carbonate of lime in, 3-97
- Coral—continued**
- first appearance on earth, 3-9, 18, 64; 1-44
  - in lower division of animal kingdom, 3-†69
  - mushroom coral, 10-†487
  - polyp, structure and behavior, 3-97; 1-†56
    - similar to hydroid, 3-105
  - reefs, islands, and atolls, 3-†97-101; 1-†56-57; 5-521, 526, 529
    - Midway Islands, 8-471
    - pre-historic, 3-30
    - sea creatures that live on, 3-135, 144, 160, 188, 196, 207
  - solitary, 3-102
  - varieties, 1-†57
    - red and related varieties, 3-102
- Coral Sea**, Pacific Ocean, maps, 5-601, 573
- Coral snake**, 3-490, 492, 501
- Coral-winged locust**, 3-347
- Corbels**, architecture, 11-454
- Corbett, Harrison, and MacMurray**, architects of Rockefeller Center, 11-510
- Corcovada Peak**, Rio de Janeiro, 5-†509
- Cord**, 9-†283, 285, 288
- Corday, Charlotte**, 6-†192
- Cordillera**, mountain group, in physiography, 1-25
- Cordillera de Mérida**, *see* Mérida
- Cordilleran Center** of ice sheet, 1-†61
- Cordilleras, American**, 7-33-A; 1-20, 28
- Cordoba, Francisco Hernandez de**, expedition to Mexico, 7-73
- Cordova, Gonsalvo Hernandez de**, conquers Granada, 6-322
- Cordova, Spain**, Great Mosque, 6-†321; 11-†451
- Cordovan leather**, 9-70
- Corelli, Arcangelo**, first great violinist, 12-224
- Corfu, island**, Mediterranean Sea, description, 6-477 *see also* index World War II, 6-493
- currant raising, 6-368-B
  - family group, 6-†476
  - map, 6-595
  - oranges, 6-368-B
- Coriander**, herb, 9-311
- "Corinne,"** by Madame de Staël, 13-122
- Corinth**, Greece
- carved ceilings, 12-178
  - Corfu colonized from, 6-477
  - destruction, 5-169, †181, †219
  - trade, 5-168
- Corinth Canal**, Greece, 6-368-B
- map, 6-595
- Corinthian capital**, architecture, 12-†94
- Corinthian Order**, architecture, 11-†418, †425
- Corinthian War**, 5-175
- "Coriolanus,"** drama by Shakespeare, 13-158
- Corium (dermis)**, skin, 2-287 fol.; 9-67
- Cork**, story of, 9-†296-97
- Cork cells**, of tree, 2-31
- examined under microscope, 2-6, 7
- Corkwood**, *see* Balsa wood
- Cormac**, Irish king, 6-144

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Cormorants**, birds, 4-†211-13  
 ability as fisherman, 3-\*232; 4-\*212  
 color plate, 4-152  
 in prehistoric period, 3-52  
**"Corn,"** poem by Sidney Lanier, 13-335  
**Corn** (broom corn), 9-\*313, †314  
**Corn** (Indian corn), main article, 9-†104-6  
   bread, 9-243  
   bred from wild maize, 2-226  
   by-product, 9-104, 106; 10-546  
   conditions favorable to growth, 8-105  
   cultivator, 9-\*105  
   ear of corn, fruit, 2-\*118  
   feed for livestock, 9-325, 329, 334, 335  
   Indian handling of, 13-\*476  
   lengthwise section of seed, 2-\*126  
   picker and husker, 8-\*105, \*128  
   pollination, 2-\*111, 113  
   popcorn, 9-106  
   problem of bumper crops, 8-121  
   section of stalk, 2-\*32  
   seeds, 2-\*124  
   transpiration of corn plant, 2-51  
   used in manufacture of drugs, 9-106  
   yields cellulose for plastics, 9-\*294  
**Corn**, sweet, 9-150  
**Corn Belt**, United States, 9-104, 106; 7-343-F  
**Corn borer**, 9-33  
**"Corn-huskers,"** by Carl Sandburg, 13-350  
**Corn husking**, 8-\*105  
**Corn Laws**, England  
   Gladstone's opposition, 12-442  
   repeal, 6-95  
**Corn snake**, 3-502  
**Corn State**, 8-106-A  
**Corncracker State**, nickname for Kentucky, 8-138-B  
**Cornea of eye**, 2-†296, \*299, 300; 1-\*436  
   and eye troubles, 1-437, 438  
**Corneille, Pierre, life and dramas**, main article, 13-109-10; 12-348  
   contemporaries, 12-412  
   portrait, 13-\*109  
**Cornelia**, wife of Julius Caesar, 12-357  
**Cornelia**, mother of the Gracchi, 5-\*216  
**Cornell, Ezra**, lays cable under Hudson River, 10-102  
**Cornell University**, at Ithaca, N. Y., 8-†265  
   Goldwin Smith Hall, 8-\*265  
**Corner shelf**, how to make, 14-†50  
**Cornet**, musical instrument, 12-258-B; 1-449  
**"Cornhuskers,"** nickname, 8-228-A  
**Cornhuskers' State**, 8-228-A  
**Cornice**, architecture, 11-\*418, 420  
**Corning, N. Y.**, glass manufacture, 12-38  
**Cornplanter Indian Reservation**, 8-342  
**Corns on toes**, 2-291  
**Cornstalk**, Indian chief, 8-432  
***Cornus florida***, tree, 8-418-A  
**Cornwall**, England  
   Arthurian romances, 14-377  
**Cornwall- continued**  
   china clay and stone found in, 12-61  
   wireless telegraph station, 10-116  
**Cornwallis, Charles**, marquis, surrender at Yorktown, 7-170; 12-478  
**Corolla of flower**, 2-102, \*110  
   tube, 2-\*172  
**Corona**, astronomy, 1-117, 272  
**Coronado, Francisco Vásquez de**, 8-224  
   and Marcos de Niza, 8-21  
   New Mexico, 8-258  
   Seven Cities of Cibola discovered, 7-92, 119  
   Texas visited, 8-376  
   Utah, 8-392  
**Coronary arteries**, 2-\*375, 377  
**Coronary cavity of heart**, 2-\*374  
**Coronation Chair**, Westminster Abbey, 12-†182  
**Coronation Gulf**, Canada, Eskimos, 7-39  
**"Coronation of Napoleon I and the Empress Josephine, The,"** painting by David, 11-\*287  
**Coronation of the Virgin**, depicted in art  
   from John of Berry's Book of Hours, 11-\*104  
   Notre Dame sculpture, 11-\*95  
**Coronation Stone of Munster**, 6-\*144  
**Coronation Stone of Saxon kings**, 6-\*42  
**Corot, Jean Baptiste Camille**, 11-329, 30  
   gives home to Daumier, 11-334  
   Legion of Honor cross bestowed upon, 11-332  
   paintings  
     "Morning," landscape, 11-\*327  
     style, 11-†326 fol  
     Virgil and Dante, 11-\*328  
     "Young Girl with Pearl Earrings," 11-†326, 330  
**Corporations, business**, organization, 7-523, 29  
   bond issues, 7-528, 535  
   capital, 7-537  
   directors, 7-525  
   dividends, 7-527  
   serving public, Wisconsin's control, 8-445  
   sinking fund, 7-535  
   stock issues, 7-525  
   stockholders, 7-525-26  
**Corporative Chamber**, legislative body of Portugal, 6-342-A  
**Corporative state**, created by Mussolini, 6-315-B  
**Corpulence**, cause, 2-356  
**Corpus callosum**, anatomy, 2-\*385, \*387  
**Corpus Christi**, festival, 12-327; 6-\*156; 13-80  
   painting by Gentile Bellini, 11-172  
   Spain, 13-80  
**Corpus of tongue**, 2-\*308  
**Corpuscles, blood**  
   red, 2-†344-46  
   white, 2-\*347, 349  
**Correggio (Antonio Allegri)**, art style, 11-184  
   dome of cathedral of Parma, painting, 11-\*181  
**Corregidor Island**, Manila, 6-531; 12-555-J  
**Corrosion**, 10-548  
**Corrugated paper**, 9-293  
**Corrupt-practices act**, 8-212-A

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Corruption, political**

- big business and politics, 7-281, 282
- Harding administration, 7-332
- in municipal government, 7-392

**Corsairs, pirate boats, 5-454****Corser, Enoch, Reverend, tutor of Mary Baker Eddy, 13-556****Corsica, island, Mediterranean Sea, description, 6-472; see also index World War II, 6-493 and Napoleon, 12-423, 424**  
British blockade, 12-421  
maps, 6-581, 588**Corte-Real, Gaspar, reaches Newfoundland, 7-32****Cortes, Hernando, conquest of Mexico, main article, 13-†467 70, 7-73 76**  
Aztecs conquered, 7-118**Cortes, Spanish parliament**

- constitution drawn up by, 6-332
- Fernando IV presented to, 6-†320

**Cortex, botany, 2-32, \*33, \*48****Cortex, of brain, 2-387****Corundum, mineral, 9-432****Corwin, Thomas, 7-239****Cory (fish hawk), 4-152****Corydon, Indiana, former capital, 8-112****Coscoroba swans (or geese), 4-†121****"Cosi Fan Tutti," opera by Mozart, 12-270****Cosmic rays, 1-419, 558 H**

- Millikan's studies, 1-351

**"Cosmos," book, by Alexander von Humboldt 13-423****Cosmos, plant**

- effect of sunlight on, 2-194
- growth and flowering time affected by artificial light, 2-223

**Cossacks, people**

- Poland, 6-†445, 448, 450
- Russia, 6-†427, 428
- Ukraine, 6-367

**Cossettes, in beet sugar making, 9-127****Costa Rica, country, Central America, description, 7-41, 48; general data, 7-48 B**

- area, 7-48 B
- climate, 7-48-B
- flag, color plate, 14- following 570, no. 15
- government, 7-48-B
- location, 7-48 B
- map, 7-598
- people, 7-48-B, 43
- physical features, 7-48-B
- products, 7-48-B
- bananas, 7-†48
- coffee, 7-48

**Coste, Dieudonne, aviator, portrait, 10-†324****Costello, John A., Irish prime minister, 6-162****Coster, Laurence, 10-48****Costigan, Captain, in Thackeray, 13-†240****Costume, main article, 9-†2-24, color plates, \*24,**

- ancient, 9-5-8, 12; 5-110, 145; 11-33

**Costume, ancient--continued**

- Greek, actor, 12-325
- bridal, Hungarian, 9-†2
- democracy's effect on, 9-20
- fashions copied in armor, 10-354, \*359
- footwear, 9-†54, †56-61
- gowns worn by wives of Presidents, 9-†15
- hats and other headdresses, 9-†88-95
- historical accuracy in art, 12-†348
- medieval, 9-†16
- men's style set by Charles II, 9-†18
- military and naval uniforms, United States, 7-†473, \*482, \*491
- modern, 9-†9 fol.
- national, 9-20
- Czechoslovakian, 6-†357, 358, \*359; 9-†2, \*23
- Dutch, 6-†344, \*352; 9-†2, \*23
- Estonian, 6-†463
- German, 6-†238; 9-†2, \*23
- Hungarian, 6-†284, \*287, \*288, \*289; 9-†2, \*23
- Icelandic, ancient, 6-†418
- Indian (East) races and castes, 5-†378, \*384
- Indians (American), color plate, 7-frontispiece, \*1, \*89, \*108; 5-†497; 9-†5, \*8, \*21
- Italian, 6-†313
- Japanese, 5-†344; 9-†19
- Javanese, 5-†523
- Lithuanian, 6-460; 9-†23
- Maoris, New Zealand, 5-†534, \*541
- Mexican, 7-†87-A
- Mohammedan pilgrims, 5-†417
- Mongolian, 9-†37
- Norwegian, 6-†387, 9-†2
- Polish, 6-†447, \*450, \*452
- Samoan, 8-†471, \*472
- Scottish Highlander, 6-†130
- Spanish, 6-†330
- Swedish, 6-†392, \*402, \*404; 9-†2
- Swiss, 6-†248; 9-†23
- Welsh, 6-†136-37, \*139-40

**modern, 9-†9 fol.****national, 9-20****Czechoslovakian, 6-†357, 358, \*359; 9-†2, \*23****Dutch, 6-†344, \*352; 9-†2, \*23****Estonian, 6-†463****German, 6-†238; 9-†2, \*23****Hungarian, 6-†284, \*287, \*288, \*289; 9-†2, \*23****Icelandic, ancient, 6-†418****Indian (East) races and castes, 5-†378, \*384****Indians (American), color plate, 7-frontispiece, \*1, \*89, \*108; 5-†497; 9-†5, \*8, \*21****Italian, 6-†313****Japanese, 5-†344; 9-†19****Javanese, 5-†523****Lithuanian, 6-460; 9-†23****Maoris, New Zealand, 5-†534, \*541****Mexican, 7-†87-A****Mohammedan pilgrims, 5-†417****Mongolian, 9-†37****Norwegian, 6-†387, 9-†2****Polish, 6-†447, \*450, \*452****Samoan, 8-†471, \*472****Scottish Highlander, 6-†130****Spanish, 6-†330****Swedish, 6-†392, \*402, \*404; 9-†2****Swiss, 6-†248; 9-†23****Welsh, 6-†136-37, \*139-40****nations that set present styles, 9-20-21****primitive, 9-†3-5, \*8, \*21****rank indicated by buttons, 9-52****reason for change in, 9-22, 24****see also Armor; Clothing and articles of apparel or adornment, as Jewelry; Shoes****Coteau des Prairies, elevated regions of western prairies, South Dakota, 8-358, 364****Coteau du Missouri, northward extension of Coteau des Prairies, 8-302, 364****Cotman, John, English painter, 11-311****Cotopaxi, volcano, Ecuador, height, 5-518-A****Cotta, Ursula, Luther befriended by, 13-†541, 542****Cottage cheese, 9-†346****Cottage plan of orphanage, 7-441****Cottages****Czechoslovakian, 6-†358****English, 9-†375****Irish, 6-†153**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Cottages—continued**

- Scotch, 6-<sup>\*</sup>134  
Welsh, 6-<sup>\*</sup>137
- "Cottar's Saturday Night, The,"** by Burns, 13-209
- Cotton, John, Reverend,** 8-167  
quotation on origin of Massachusetts' name, 8-176-B
- Cotton, manufacture, plant to cloth, main article,** 9-†26-34  
ancient times, 9-27; 10-403  
bales, 8-<sup>\*</sup>384  
boll weevil, 9-†33; 3-339, <sup>\*</sup>341  
by-products, 9-34  
compared with wool, 14-†550  
form of cellulose, 2-40  
interesting facts about cotton, 9-2<sup>†</sup>  
linters, 9-34  
machinery, effect on the South, 9-26  
manufacture of  
Japan, 10-236  
United States, 7-343-F; 9-34  
Amoskeag mills, 8-240  
Mississippi, 8-205  
New Hampshire, 8-239  
North Carolina, 8-294  
mercerizing process, 9-29  
picking, 8-<sup>\*</sup>409; 9-<sup>\*</sup>26, <sup>\*</sup>27; 10-<sup>\*</sup>342  
plant, 9-<sup>\*</sup>26, <sup>\*</sup>312; 2-<sup>\*</sup>42  
plantation, 9-<sup>\*</sup>32; 7-<sup>\*</sup>245  
producing regions, 9-27; 5-†462; 10-404  
United States, 7-343-E  
Alabama, 8-1, 4  
Arkansas, 8-29  
Mississippi, 8-203  
South Carolina, 8-354, 355  
Southern States, 7-217; 8-<sup>\*</sup>81, 82, 83  
Texas, 8-381, <sup>\*</sup>384  
rayon contains, 9-86  
seeds, use of, 9-34  
spinning and weaving, 9-†30-31, 34  
surplus absorbed by chemical manufacturing, 10-546  
thread, 9-30, 31; 10-339  
varieties, 9-28, †32; 10-404  
weighing in by cotton pickers, 10-<sup>\*</sup>403  
wool mixed with, 9-81
- Cotton Belt,** Alabama, 8-4
- Cotton exchanges,** 9-29
- Cotton Exposition,** Atlanta, Ga., 9-27
- Cotton fiber,** 9-29
- Cotton gin,** main article, 10-†403-7; 9-<sup>\*</sup>30<sup>†</sup>  
and slavery in Southern United States, 7-217
- Cotton linters,** 9-34  
artificial fibers made from, 10-546
- Cotton picker machine,** 8-<sup>\*</sup>204; 9-<sup>\*</sup>26
- Cotton spinner,** sea cucumber, 3-139
- Cotton State,** nickname for Alabama, 8-8-A
- Cottonmouth** (moccasin), snake, 3-492
- Cottonseed meal,** used for fertilizer, 7-454
- Cottonseed oil,** 9-34; 10-547  
uses, 9-312

**Cottontail rabbits,** 4-386

**Cottonwood Creek,** Montana, sapphire production, 8-218

**Cottonwood tree,** Spanish name, 8-380

**Cotyledons of plant,** 2-<sup>\*</sup>48, 128

**Coucal,** bird, 4-<sup>\*</sup>180

**Couches,** ancient, 12-<sup>\*</sup>179, 181

**Cougar,** animal, 4-292, 293, †294

**Coulee,** in physiography, 8-428

**Council, city,** 7-392, 393

**Council, English,** development into parliament, 7-353

**Council of Clermont,** 5-282

**Council of Europe,** international body, 6-563

**Council of Nationalities,** governing body, Russia, 6-443-B

**Council of People's Commissars,** Russia, 6-443, 443-B, 439

**Council of Ten,** Venice, 6-<sup>\*</sup>307

**Council of the Indies,** Spain, 5-500

**Council of the Union,** governing body, Russia, 6-443-B

**"Count of Monte Cristo, The,"** by Dumas, 13-128

**"Counterblaste to Tobacco,"** by James I, 9-222

**Counterpoint,** music, meaning, 12-229

Bach's improvements, 12-263

origin of name, 12-216

Wagner's use of, 12-250

**Counter-Reformation,** meaning, 6-214

Austria, 6-262

Switzerland, 6-252

**Counterweight of elevator,** 1-†377

**Counting, methods of, from earliest times,** main article, 10-†420-26, 428

Sumeria, 5-82

**"Counting the Money,"** painting by Murillo, 11-<sup>\*</sup>255

**Countries, rise and fall of,** 5-45

**"Country of red faces"** (Tibet), 5-438

**County, subdivision of state, government,** 7-386, 388, 389

known as "parish" in Louisiana, 8-142

**County clerk,** duties, 7-389

**County fairs,** Connecticut, exhibit, 8-<sup>\*</sup>50

**County treasurer,** 7-389

**Couperin, François,** 12-227

**Coupons,** bond, 7-528

**Courbet, Gustave,** life and paintings, 11-338, 340, 342

"Burial at Ornans," painting, 11-<sup>\*</sup>337

contemporaries, 11-337

death, 11-344

**Coureurs de bois,** Canadian traders, 7-†6, 11; 10-139; 13-487

**Couriers, messengers**

Aztec, 10-30

Egyptian, 10-<sup>\*</sup>85

Greek, 10-30

Inca, 7-92; 10-30

mounted

of the counts of Thurn and Taxis, 10-86

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Couriers, mounted—continued**Pony Express, 10-<sup>\*</sup>87, 88

Persian, 10-31, 86, 92

Roman, 10-31, 86

**Court, for ball games, 14-466, 484, 486****Court, law** *see* Courts**Court of Farewells, Fontainebleau, Napoleon's**  
farewell, 11-488**Court of the Gentiles, temple at Jerusalem, 5-125****Court of the Lions, Alhambra, 11-<sup>\*</sup>451****Court of the White Horse, Fontainebleau,**  
Napoleon's farewell, 11-488**Court tennis, game, 14-465****Courtesy on the road, 2-433, 436, 439, 446****Courtrai, Belgium, 6-350**

flax, 9-48

**Courts**

civil and criminal cases, 8-332

common law, 7-386

England

Star Chamber, 6-42

trial by jury introduced, 6-†21

jury, of Athens, 7-347

juvenile, 7-442

primitive trials, 7-<sup>\*</sup>346state, *see* **Subhead** political facts *under names*  
of various states

Supreme Court of U.S., 7-366

text of Constitution concerning, 7-187

**Courtship, spiders, 3-407, 411**birds, *see* Birds, courtship**"Courtship of Miles Standish, The," by Long-**  
fellow, 13-<sup>\*</sup>302, 303**Coustou, Guillaume, sculptor, 11-237****Coustou, Nicholas, portrait bust, 11-<sup>\*</sup>237****"Coutume de Paris," French law, 7-33-J****"Couturiers," French designers, 9-20****Covadonga, Spain, church, 6-<sup>\*</sup>335****Covenanters, Scotch, 6-128****Covent Garden, theater, 12-331****Coverdale, Miles, translates Bible, 10-13****Covered bridge, 10-<sup>\*</sup>212****"Covered Wagon, The," photoplay, 10-509****Covered wagons, 10-†146, 148, <sup>\*</sup>153, <sup>\*</sup>190;**  
7-<sup>\*</sup>231-32, <sup>\*</sup>281**Coverley, Sir Roger de, fictional character, 13-182****"Coverley Papers," 13-182****Covey of game birds, 4-94****Covington, Ky., manufactures, 8-138****Cow-puncher, *see* Cowboys****Cowbirds, 4-<sup>\*</sup>86, †89****Cowboys**Argentina, 5-<sup>\*</sup>505Colorado, 8-<sup>\*</sup>46

frontier days, 7-278, 279

life, 9-†318, <sup>\*</sup>319, <sup>\*</sup>326

Wild West shows, 12-573

Wyoming, 8-452

**Cowfish, 3-207****Cowlitz River, Wash., 8-428****Cowpasture River, Va., 8-418****Cowpens, S. C., battlefield site, 8-356-A.****Cowper, William, life and works, main article,**  
13-213**Cowpox, used for inoculation against smallpox,**  
13-366**Cowrie shell, 3-<sup>\*</sup>145****Cows, milk and milking, 9-†331-38**

purple, as seen by artists, 11-344

sacred to Hindus, 5-384

scale drawing, 14-<sup>\*</sup>63

service to man, 9-331

wild, 4-390

*see also* Cattle**Cows, ant, aphids domesticated as ants' cows, 3-**  
324, †325**Cox, James M., presidential candidate, 7-332****Coxey's army, 12-456-B****Coxswain, in racing shell, 14-532, <sup>\*</sup>533****Coyote (prairie wolf), 4-<sup>\*</sup>298, 301****Coyote State, 8-364-A****Coypu rat, 4-†382****Coysevox, Antoine, sculptures, 11-237**bust of Colbert, 11-<sup>\*</sup>239**"Cozy Corner, A," painting by Francis D. Millet,**  
11-<sup>\*</sup>363**Crab, constellation, *see* Cancer****Crab apple, wild, blossoms, 2-<sup>\*</sup>162****Crab Islands of Virgin Island group, 8-467**

map, 7-601

**Crabtree, John, sees transit of the planet Venus,**  
1-<sup>\*</sup>148**Crabs, main article, 3-†174-83, <sup>\*</sup>69**

border-land crabs, 3-179

disguises worn by, 3-†84, †93, †106, 115, <sup>\*</sup>143,  
<sup>\*</sup>148, <sup>\*</sup>174, 180, <sup>\*</sup>182

first appearance on earth, 3-64

kindred of Trilobites, 3-10

life cycle, 3-†177

living with seaworm, 3-123

shore crabs, 3-176

swimming crabs, 3-182

**Crabtree, Charlotte ("Lotta") American ac-**  
tress, 12-332**Crack willow, tree, 2-158****Cracker race, game, 14-159****Cracker State, nickname for Georgia, 8-84****Crackers, poor tenant farmers, 8-82, 84****Crackers, nickname**

Florida, natives, 8-76-A

Georgia natives, 8-84

**Cradle**basket, 12-<sup>\*</sup>135of Peregrine White, 12-<sup>\*</sup>198**Cradle scythe, 10-†410****Cradles of civilization, 5-†76; 9-240****Craft union, compared with industrial union, 7-**  
540, 562; *see also* Guilds**Crafts and Arts, 12-†1-199 (*see also* main sub-**  
*jects listed below)*basketry, 12-†128-35; *see also* Basketry

bronze and bronzes, 12-†12-24

carving, 12-†94-107; *see also* Carving and  
subdivisions of carving, as Stone carving

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Crafts and Arts—continued**

- enamels and enameling, 12-†63-68  
 furniture, 12-†174-99  
 glass and glassware, 12-†26-38  
 goldsmithing and silversmithing, 12-†79-92  
 inlay, 12-27, 82, \*99, 102, 176 fol.  
 ironwork, 12-†1-10  
 jewelry, 12-†117-26  
 lace and lace making, 12-\*163-72  
 mosaics, 12-†109-15  
 needlework, *see* Needlework  
 Neolithic Age, 5-37  
 pottery, 12-†40-61  
 rugs, 12-†146-61  
 stained glass, 12-†70-77  
 tapestry, 12-†137-44  
*see also* subhead arts and crafts, under countries  
 and periods, as Gothic arts and crafts;  
 Manual training
- Craig, Sir Edward Gordon**, scenic designs, 12-334  
**Craigellachie**, Canada, railway, 7-\*25  
**Craigie House**, Cambridge, Mass., 11-\*504,  
 13-\*301, 303  
**"Craig's Wife,"** drama by George Kelly, 13-355  
**Cranach, Lucas**, art of, 11-\*211, 212  
**Cranberry**, 9-156, 159  
 picking machine, 9-\*157  
**Cranberry bogs**, 9-\*157, 159  
 New Jersey, 8-245  
**Crane, Hart**, poet, 13-353  
**Crane, Ichabod**, fictional character in Irving's  
 "Legend of Sleepy Hollow," 8-274  
**Crane, Stephen**, author, 13-346  
**Crane, machine**, 10-\*247  
**Crane fly**, 3-364  
**Crane People**, *see* Aztecs  
**Cranes, birds**, 4-\*104-6, †111; 3-53  
**Crankshaft**  
 automobile, 10-288  
 Diesel engine, 10-\*276  
**Cranmer, Thomas**, archbishop of Canterbury,  
 6-\*47, 48  
**Crassus, Marcus Licinius**, in First Triumvirate,  
 5-223; 12-357  
**Crater battlefield**, Virginia, 8-418-A  
**Crater Lake**, 8-325  
**Crater Lake National Park**, 7-407; 8-332  
**Craters of the Moon National Monument**,  
 Idaho, 8-92-A; 7-\*418  
**Craters on moon**, 1-131, 140, \*142-43  
**Craw-thumpers**, people of Maryland, nickname,  
 8-162-B  
**Crawfish**, *see* Crayfish  
**Crawford, Thomas**, "Dancing Girl," statue by,  
 11-\*375  
**Crawford's Notch**, N. H., 8-242-A  
**Crawl**, swimming, 14-†535  
**Crayfish**, or **crawfish**, 3-187, †254-57  
 change in spelling of term, 10-23  
 fresh water, 3-†254-57  
 salt water, 3-187  
 tricked by ibis, 4-147
- Cream Ridge**, section of N. J., dairying, 8-245  
**Creameries**, butter making in, 9-341  
**Creation**, theories of American Indians, 7-100  
**"Creation, The,"** oratorio, by Haydn, 12-237,  
 274, \*276  
**"Creation of Man,"** painting by Michelangelo,  
 11-\*158  
**Crécy, Battle of**, 6-27, 172  
**Credit and bank loans**, 7-516-17, 520  
**Creek Indians**, 8-6  
 Florida, 8-71  
 Jackson's war with, 12-512, 515  
 log house, 7-\*101  
 Oklahoma land grant, 8-316, 317  
 one of "Five Civilized Tribes," 8-320-B  
**Creepers**, bird, 4-†126  
**Creepers**, stone fly, 3-387  
**Creighton, Pa.**, plate-glass industry, 8-339  
**Cremona, Italy**, violins, 12-224, 258  
**Crenelations** (battlements), 11-\*460  
**Creole State**, 8-146-A  
**Creoles**, people  
 Latin America, 7-78  
 Louisiana, 8-142, 146-A  
**Creon**, and Antigone and Polyneices myth, 14-454  
**Cresote**, a product of coal tar, 9-445  
 death to Black widow spider, 3-413  
**Crescent**, emblem of Islam, 5-397  
 meaning of word, 1-127  
**Crescent Lake Migratory Bird Refuge**, 8-228-A  
**Crescent moon**, 1-\*124, 127  
**"Crescit Eundo,"** quotation from Lucretius, 8-  
 262-A  
**Crespo, Joaquin**, 5-517  
**Cress, vegetable**, 9-150  
**Crested auklet**, bird, 4-206  
**Crested cassique**, bird, 4-\*181  
**Crested eagle**, 4-\*154  
**Crested flycatcher**, bird, 4-†43  
**Crested screamer**, bird, 4-\*119  
**Cretaceous period**, 3-37, 39  
 chalk cliffs, 3-44  
 forms of life in, table, 3-64  
 fossil fish, 3-\*3  
 place in geologic time table, 1-40  
 rocks typical of, 1-\*40  
**Cretan bull**, captured by Hercules, 14-429  
**Crest**, of mountain range, in physiography,  
 1-25  
**Crete**, ancient civilization, Greece, description  
 and history, main article, 5-†143-46; 11-  
 415-16; 12-13  
 art, 11-†31-34  
 bronze work, 12-13  
 carving, 12-102  
 statuette (snake goddess), 11-\*34  
 Egyptian influence, 5-144, 146; 11-32  
 favorite subjects, 5-†146; 11-32  
 goldsmithery, 12-82  
 jewelry, 12-122  
 painting, 11-\*31, 32, \*33  
 pottery, 5-†144 fol.; 11-\*32, \*33; 12-†48

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

**Crete, art—continued**

- stone vases, 5-<sup>\*</sup>146
- typical designs, 12-13
- Athenian tribute to, 14-447
- Bronze Age, 12-13
- center of Aegean civilization, 11-415
- costumes of day, 5-145; 11-<sup>\*</sup>33
- excavations, 5-16, 17, 143
- influence of Egyptian culture on, 5-144
- lyre from, 12-<sup>\*</sup>226
- map, 5-88, 150
- Minotaur, monster, 5-16, 17, <sup>+</sup>143; 14-447
- Mohammedanism, 6-478
- palace of Minos at Cnossus, 5-143 fol.; 11-415, 416
- labyrinth, 14-448; 11-32, 415; 5-16, 17
- seafaring people, 10-162; 12-14
- trade, 5-144, 145
- writing, 5-144

**Crete, island, Mediterranean Sea**

- recent history, 6-478
- map, 6-595; *see also* index World War II, 6-493

**Cricket, game, 2-<sup>\*</sup>360**

- South Africa, 5-<sup>\*</sup>491-A

**Cricket, insect, 3-<sup>+</sup>345 fol****Cricket frog, 3-422****"Cricket on the Hearth, The," by Charles Dickens, 3-351****"Crime and Punishment," by Dostoyevsky, 13-95****Crime classification, 7-388****"Crime of Sylvestre Bonnard, The," by Anatole France, 13-137****Crimea, peninsula reaching into the Black Sea, Russia**

- annexed by Russia, 6-433
- map, 6-602

**Crimean War**

- defeat of Russia, 6-436
- England's interest in, 6-98, 5-414
- nurses, 7-426, <sup>\*</sup>429

**Criminal case, 8-332****Criminal law, codified, 7-388****Criminal Syndicalism Laws, 7-334****Criminals, police pursuit of, 7-393****"Crimson, The," Harvard paper, 12-555-B****Crimson-breasted barbet, color plate, 4-<sup>\*</sup>184****Crimson tragopan, bird, 4-<sup>\*</sup>189****Crinoids (sea lilies), prehistoric, 3-9, 14, 18, 64****Crinoline skirts, 9-<sup>\*</sup>14, <sup>\*</sup>17, 20****Cripple Creek mining district, 8-<sup>\*</sup>49****Crisfield, Md., crab center, 8-162****"Crisis, The," novel by Churchill, 13-347****Crispi, Francesco, Italian prime minister, 6-309****"Crispin," by Le Sage, 13-116****Cristina, queen regent of Spain, 6-334****Cristofori, Bartolomeo, 12-234****piano made by, 12-258-D****"Critic, The," by Sheridan, 13-205****"Critique of Pure Reason, The," by Kant, 13-22****Crivelli, Lucretia, portrait, 11-151****Croatian Indians, 8-286****Croats, a people of Yugoslavia, 6-290-B, 363, 364****Croce, della, cardinal, portrait, 11-<sup>\*</sup>194****Crocheting, needlework**

- lace, 12-172
- lesson in, 14-<sup>+</sup>80

**Crocker, Charles, 10-192****Crockery, *see* Pottery****Crockets, architecture, 11-<sup>\*</sup>463, 470****Crockett, David (Davy), 7-221**

- at the Alamo, 7-235
- woodcraft, 14-567

**Crocodile (Limpopo) River, Africa, 5-491 B****Crocodiles, main article, 3-<sup>+</sup>436-43, <sup>\*</sup>445**

- breathing, 3-438
- difference between alligators and, 3-<sup>\*</sup>442, 443
- eggs and nesting, 3-<sup>\*</sup>436, 439
- in zoo, 4-479
- life span, 3-440
- worshiped by Egyptians, 3-442

**Croesus, king of Lydia, 5-404****Aesop and, 13-42****captured, 5-102****goldwork ordered by, 12-82****Solon and, 5-<sup>\*</sup>102; 12-<sup>\*</sup>336****Croix de Feu, French fascist party, 6-202****Cro-Magnon man, 5-<sup>+</sup>27, <sup>\*</sup>30, 39****resemblance of Canary islanders to, 6-491****Crome, John, English painter, 11-311****Crompton, Samuel, invents spinning mule, 10-341****Cromwell, Oliver, life, main article, 12-<sup>+</sup>406-9****after Battle of Naseby, 6-<sup>\*</sup>64****and Charles I, 6-<sup>\*</sup>127****approves destruction of palaces, 12-188****army, 6-66, 68; 12-407****becomes lord protector, 12-409****Carlyle's biography, 13-236****Civil Wars, 6-66****Dryden's cause of, 13-173****permits Jewish immigration, 5-137****portrait, 12-<sup>\*</sup>408****refuses emblem of authority, 6-<sup>\*</sup>69****rule in England, 6-68****rule in Ireland, 6-<sup>+</sup>154, 155****treatment of Scotland, 6-127****Cromwell, Richard, 6-70****Cromwell, Thomas****minister of Henry VIII, 6-45; 12-392, 393****portrait, 6-<sup>\*</sup>45****Cromwell, Conn., florist industry, 8-58****Cronus (Saturn), god, 1-155; 10-<sup>\*</sup>459****devours offspring, 14-407****Crook, George, and Apache Indians, main article, 12-<sup>+</sup>489-90****Crookes, Sir William, 10-493****Crookes tube, 10-493****Crop, of chicken, 9-352****Crop rotation, 7-463****Crops, fungus parasites, 2-137, 138, 140****Cross, John Walter, marriage to George Eliot, 13-261**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Cross, Mary Ann Evans, *see* Eliot, George**

**Cross**

Celtic, 11-<sup>\*</sup>83

Swastika, 12-16

**Cross and Bevan**, viscose process discovered by, 9-83

**Cross-country runs**, 14-472

**Cross-eyes**, 2-300

**Cross-pollination, *see* Pollen and pollination**

**Cross tag**, game, 14-172

**Crossbills**, birds, 4-<sup>\*</sup>120, †130

**Crossbow**, 10-<sup>\*</sup>355

**Crossbreeding**, biology, *see* Hybridism

**Crosse**, stick used in lacrosse, 14-†493

**Crossfish**, 3-<sup>\*</sup>128

**Crosshatching on stained glass**, 12-76

**Crossing the Rubicon**, origin and meaning of phrase, 5-224; 12-358

**Croton bug**, 3-355

**Croton Dam**, New York, 10-<sup>\*</sup>539

**Crotona**, Italy, school of Pythagoras, 13-4

**Crow**, bird, 4-156, †227-28

in Oligocene period, 3-53

**Crow**, constellation, star maps showing:

July and August, 1-178-H

March and April, 1-178-D

May and June, 1-178-F

**Crow**, grappling hook on ship, 5-212

**Crow Indian Reservation**, national monument located in, 8-220-A

**Crowbar**, mechanical principle, 1-325, 327

**Crowhigh Butte**, historical point, 8-302-A

**Crown**, Demosthenes' oration on the, 12-345

**Crown**, constellation, star maps showing:

July and August, 1-178-H

March and April, 1-178-C

May and June, 1-178-F

Sept. and Oct., 1-178-I

**Crown**, of cut diamond, 9-<sup>\*</sup>130

**Crown**, of tooth, 2-<sup>\*</sup>313-14, 315

**Crown colonies**, Newfoundland, 7-33

**Crown fire**, in forest, 2-246

**Crown Hill Cemetery**, Indianapolis, memorial to James Whitcomb Riley, 13-<sup>\*</sup>337

**"Crown of Thorns"** speech of Bryan, quoted, 7-292

**"Crown of Wild Olive, The,"** by Ruskin, 13-238

**Crowned crane**, bird, 4-<sup>\*</sup>105

**Crowned pigeon**, bird, 4-<sup>\*</sup>77

**Crowned road**, 2-440, <sup>\*</sup>446

**Crow's nests**, fire lookouts, 2-<sup>\*</sup>245

**Crozat**, Antoine, 8-141

**Crucifix**, enamel, 12-<sup>\*</sup>65

**Crucifixion**, enacted in Passion Play, 12-327, 328

**Crucifixion**, paintings of

Perugino, 11-<sup>\*</sup>142, 143

Rembrandt, 11-277

Tintoretto and Mantegna compared, 11-186

**Crude turpentine** (oleoresin), 9-311, 313

**"Cruger, Mrs. John Church,"** portrait by G. P. A. Healy, 11-<sup>\*</sup>369

**Cruisers**, war vessels, 7-485; 10-<sup>\*</sup>348

**Crummle**, Irish name for Cromwell, 6-154

**Crusaders**

aided by St. George, 13-524

armor, 10-352

before Jerusalem, tapestry, 6-<sup>\*</sup>167; 12-<sup>\*</sup>137

Constantinople sacked by, 5-409

dedicated to serve the Virgin, 11-94

Jerusalem taken, 5-409

legs crossed on Gothic tombs, 11-98

looting, 12-88

metal work encouraged in West by, 12-86

scallop shells worn by, 5-157

**Crusades**, 5-280-83; 6-<sup>\*</sup>22

benefits to civilization, 5-283

Children's Crusade, 5-283, <sup>\*</sup>296

First, 5-<sup>\*</sup>280, 282, 289, 409

Third, 5-283

Fourth, 5-409

advantages to Venice, 6-297

Fifth, 5-281

Finland, 6-394

Jewish persecutions, 5-135

Louis IX's, 12-<sup>\*</sup>376, 377, †378

map, 5-<sup>\*</sup>296

part played by Venice in, 6-297

People's, 5-408

reasons for, 5-408

Richard the Lion-hearted's, 12-372, 373

Saint Bernard of Clairvaux preaches, 13-535

Tasso's poem about, 13-67, 68

**"Crusoe, Robinson,"** novel by Defoe, 13-177

calendar made by Crusoe, 10-475

**Crustaceans**, class of animals

crabs, 3-†174-83

family resemblances, 3-199

lobsters and kin, 3-†185-92

prehistoric, 3-10, 18, 24

crayfish, 3-†254-57

shrimps

fresh-water, 3-257

sea, 3-†187-89

*see also under names of crustaceans, as* Prawns; Shrimps

**Crwth**, Welsh musical instrument, 12-<sup>\*</sup>226

**Crying**, why babies must cry, 2-287

**Cryolite mines**, Greenland, 6-483

**Cryptography**, secret writing, main article, 14-†143-48

**Crystal**, rock, *see* Rock crystal

**Ctesibius of Alexandria**, makes water clock, 10-†461

**Cuba**, island, West Indies, **description and history**, 7-55-56, †60; general data, 7-60

animal life, 3-<sup>\*</sup>440; 4-<sup>\*</sup>385

area, 7-60

climate, 7-60

conquered by Spain, 7-73

De Soto governor of, 13-465

flag, color plate, 14-first color page following 570, no. 16

government, 7-56, 60

history, 7-55-56, 60

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Cuba, history—continued**

- rebellion of 1895, 6-334
- relations with U. S., 7-56, 297
- Spanish-American War, 7-296
- struggle for freedom from Spanish rule, 7-56, 294

- location, 7-60
- map, 7-600
- mineral resources, 7-56
- people, 7-60
- physical features, 7-60
- products and industries, list, 7-56, 60
  - Spanish cedar, 9-258
  - sugar, 9-116
  - tobacco, 9-223
- provinces, 7-60
- sports, baseball, 14-508
- trade, 7-56

**Cube, of number, algebra, 10-433****Cubic measure, 10-375****Cubism, art, 11-\*388, 391****Cubit, measure, 10-373****Cuchullin, Irish hero, 6-144****Cuckoo, bird, 4-†75, \*141, \*170, 174****Cuckoo bee, 3-304****Cuckoo family, birds, feet, 4-142****Cuckoopint, plant, pollination, 2-†106****Cucumber, fruit of, 2-\*121**

seeds squirted out by, 2-\*212, 214

**Cucumber, sea creature, 3-†138-39, 10-\*488****Cucumber beetle, 3-\*334****Cucumber tree (magnolia), 2-†189, \*273****Cud-chewing animals, 4-403****Cudbear, dye, 2-80****Cue, billiard, 14-†477, †478****Cugnot, Nicolas Joseph, invents horseless wagon, 10-175, 277****Cui, César Antonovich, Russian composer, 12-313****Cuirass, armor, 10-351****Culex mosquito, 3-\*363****Culion, island of Philippines, leper colony, 5-570****Cullinan diamond, 9-431****Culloden, Battle of, 6-75, 132**

followed by Scottish emigration to America, 8-289

**Culpepper, John, early settler of North Carolina, 8-288****Culpepper's Rebellion, 8-288****Culture pearls, 3-164****Cuma, Mount, Italy, cave of sibyl, 5-207****Cumae, Battle of, 5-192****Cumaeen sibyl, 5-\*207****Cumberland, Duke of, river and gap named after, 8-368****Cumberland, Md., industries, 8-161****Cumberland county, N. J.**

agriculture, 8-245

fishing industry, 8-247

**Cumberland Gap, 8-431, 368****Cumberland Plateau or Mountains  
Alabama, 8-8****Cumberland Plateau—continued**

Indiana, 8-116

Kentucky, 8-138-A

Tennessee, 8-366, 373

climate, 8-373

**Cumberland River, U. S., 8-367**

Kentucky, 8-138-A

name, 8-368

Tennessee, 8-373

**Cumberland Road, 10-153****Cumberland University, founded, 8-369****Cumberland Valley, Pennsylvania, 8-340****"Cummy," Stevenson's nurse, 13-265****Cumulus clouds, 1-236, \*239, \*245, \*247, \*249**

electricity in, 1-246

**Cunard, Samuel, 10-222****Cunard Line, steamships, 10-222, 223****Cuneiform inscriptions**

Babylonian, 10-\*34, \*43, 44, \*74; 5-†87, 104;  
9-\*276; 12-\*106

Chaldean, 5-\*96

Hittite 5-115

Persian, 5-104

Sumerian, 5-†78, 82

**Cunningham, Sir Alan, admiral, 6-\*548****Cunningham's skink, lizard, 3-\*460****Cup, constellation, 1-178****Cup and saucer limpet, 3-145****Cup fungus, 2-\*73, 76****Cupani, Franciscus, discovers sweet pea, 2-228****"Cupbearer," Cretan sculpture, 11-32, \*33****Cupboards, furniture, 12-181, †184 fol****Cupid (Eros), god, 14-409, \*411, 438; 5-\*172**

and Psyche, 14-\*460, 461

Praxiteles' statue, 11-52

**"Cupid's workshop," 14-\*581****Cups**

carved ivory, 12-\*99

Egyptian, 12-\*51

sporting trophies, 14-528, 530; 10-173

Vaphio cup, 12-82, \*83; 11-32

*see also* Drinking cups

**Cupule, botany, 2-84****Curaçao, island, West Indies, 5-518-B, 602****"Curaçao," steamboat, first to navigate the Atlantic, 10-222****Curare, drug, 2-396****Curassows, birds, 4-\*78, \*103****"Curate of Tours, The," by Honoré de Balzac, 13-128****Curd, in cheese making, 9-346, \*344****Curiatii, Roman tribe, 5-\*206****Curie, Marie Skłodowska**

discovers radium, 1-283; 9-424

portraits, 1-\*284; 9-\*425

**Curie, Pierre, discovers radium, 1-283****Curium, element, 1-542, \*551, 555****Curlews, wading birds, 4-\*11, 117**

plover tribe, 4-114

**Curling, game, 1-\*316****Currant, berry, 9-156, 158, 159****Currency, money, defined, 7-508; *see also* Money**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Current, electric**, *see* Electric current
- Currents, air**, main article, 1-†222-25, 399
- Currents, ocean**, 1-67, 223  
Humboldt or Peruvian, 5-518-D  
Tsushima Current, 5-364-B
- Currie, N. C.**, military park, 8-296-A
- Curry Bird, Game, and Fish Refuge**, 8-16-B
- Curry powder**, spice, 9-209, 312
- "Curse of Kehama, The,"** by Southey, 13-220
- Curtain wall of brick**, 9-378
- Curtin, John**, Australian premier, 5-560-C  
biography, 6-565
- Curtis, Charles**, U. S. vice president, 12-456-F
- Curtis Institute of Music**, 8-342
- Curtiss, Glenn**  
hydroplane, 10-316  
record flight, 10-318
- Curtiss Commando**, cargo carrier, 6-537
- Curule chair**, 12-181
- Curve**, in baseball pitching, 14-504
- Curved space**, Einstein, 13-409
- Curves**  
banking of, 1-310, \*311  
driving danger, 2-439, 440, 444  
chart, 2-440
- Cuscus**, pouched animal, 4-468
- Custer, George A.**, 7-†280  
Sitting Bull's victory, 8-218  
South Dakota freed from Indians by, 8-360
- Custer Battlefield National Cemetery**, 8-220-A
- Custer State Park**, South Dakota, 8-364-A
- Custis, Martha** (Mrs. George Washington), marriage, 12-475
- Custis, Mary** (Mrs. Robert E. Lee), 12-525
- Customs duties**, 7-513, 514
- Customs Union of German states**, 6-228
- Cut**, in hill, 1-19
- Cut glass**, 12-31, †34, 35
- Cut-outs from paper**, 14-†9, †11, †12
- Cuticle of leaf**, 2-26
- Cutri, Leonardo da**, skill at chess, 14-488
- Cuts, printing**  
half-tones, 10-†67-71  
woodcuts, 10-65
- Cuts, treatment for**, 2-405
- Cuttings**, method of propagating sponges, 3-87
- Cuttle bone**, 3-171
- Cuttlefishes, mollusks**, 3-†169-71, 9
- Cutwork**, embroidery, 12-164
- Cuvier, Georges, baron, life**, main article, 13-†423-24  
portrait, 13-423
- Cuyahoga County, Ohio**, quarries, 8-312
- Cuyahoga River, Ohio**, 8-312-A
- Cuyuna Range**, iron range in Minnesota, 8-196
- Cuzco, Peru**, 5-518-D  
capture, 13-464  
Inca capital: temple, 5-495; 7-92
- Cycad fern**, 7-419
- Cycads, plants**, 2-99
- Cyclades, islands, Aegean Sea**, map, 6-595
- Cycle**, meaning, 1-116
- Cyclone State**, 8-132
- Cyclones, storms**, 1-228, 277
- Cyclopes, giants in mythology**, 13-30; 1-75
- "Cyclops, The,"** by Euripides, 13-38
- Cyclotron**, 1-351
- Cygnets, baby swans**, 9-353
- Cylinder, seal**, 5-78; 12-106
- Cylinder head**, Diesel engine, 10-276
- Cylinder liner**, Diesel engine, 10-276
- Cylinder press**, 10-58, \*59  
invented, 10-77
- Cylinders**  
automobile, 1-†287, 10-†282  
in steam engine, 10-397, 398
- Cymbals, music**, 12-258-C
- "Cymbeline,"** drama by Shakespeare, 13-158
- Cypress, tree**, 2-99, 268
- Cypripedium reginae*, 8-198-A
- Cyprus, island**, 6-479, 480  
bronze tripod, 12-176  
copper, 12-14  
gold bowl, 12-83  
map, 5-582  
pottery, 12-50  
taken by Richard the Lion-hearted, 12-373
- "Cyrano de Bergerac,"** by Rostand, 13-137
- Cyrenaica, dist., Africa**, 5-451, 455
- Cyrene (Benghazi), Cyrenaica, Africa**, 5-455  
statue of Venus from, 11-65
- Cyrus the Great, king of Persia**, 5-160  
rule and conquests, 5-102, †103
- Cyrus the Younger, king of Persia**, 5-177
- "Cyrus Field,"** cable ship, 10-445
- Cystoideans** (feather starfishes), in Ordovician period, 3-13
- Cytoplasm of cell**, 2-†7, \*21, †279, †280
- Czechoslovakia, country, Europe**, description and history, 6-†357-60, general data, 6-290-A  
agriculture, 6-290-A  
alliance with Russia, 6-241  
area, 6-290-A  
climate, 6-290-A  
communication, 6-290-A  
costumes, 6-357, 358, \*359; 9-\*2, \*23  
deserts Austria in World War, 6-275, 358  
divisions, 6-290-A  
flag, color plate, 14-following 570, no. 17  
government, 6-290-A  
location, 6-290-A  
maps, 6-587, 570  
music and musicians, 12-256, †308, 310  
needlework, 12-171  
people, 6-290-A, \*357-59; 9-\*2, \*23  
discontent under Austrian rule, 6-269 fol.  
love of color, 6-358  
physical features, 6-290-A  
products and important industries, 6-290-A, 357-58  
beet sugar, 6-290-A  
glass buttons, 9-52

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Czechoslovakia, products** *continued*  
 glassware, 12-\*33, 34  
 pitchblende, 9-426  
 river transportation, 10-257  
 rivers, 6-290-A; 10-258, 259

**Czechoslovakia—continued**  
*see also* Bohemia; Silesia  
**Czechs**, 6-290-A; *see also* Czechoslovakia, people  
**Czerny, Karl**, finger exercises for piano, 12-298



**D minor symphony**, by César Franck, 12-254  
**Da Vinci, Leonardo**, *see* Vinci, Leonardo da  
**Dabchick** (grebe), bird, 4-\*108, 111  
**Dacia**, Roman province  
   added to Roman Empire, 5-247  
   Roman conquest of, 5-240  
**Dacians**, Roumanians descended from, 6-368 B  
**Daddy longlegs**, 3-363  
**Daedalus**, mythology, 11-415-16  
   built Cretan labyrinth and palace, 11-415  
   painted by Peter Breughel, 11-\*190, 202  
**Daemonelix**, plant, fossilized stem, 2-\*2  
**"Dafne,"** opera by Jacopo Peri, 12-223  
**Daggers of Mycenae**, 12-\*13, \*64  
**Dagobert I**, Frankish king, 5-292  
**Daguerre, Louis**, photography, 10-†448  
**Daguerreotype**, 10-448  
**Dahlias**  
   breeding, 2-231  
   cactus dahlia, 2-232  
**Dahomey**, colony, Africa, 5-470, 473  
   map, 5-574  
**Daily Good Turn**, of Scouts, 14-544, 548  
**Daimler, Gottlieb**, invents internal combustion engine, 10-278  
**Daimyos**, Japanese social class, 5-347, 358  
   give up feudal rights, 5-363  
**Dairying, our milk from cow to consumer**  
   main article, 9-†331-38  
   breeds of cattle, 9-332, \*333, 334; 6-†488  
   butter making, 9-†340-42, 338  
   cheese making, 9-†344-48, 338  
   Finland, 6-\*457  
   food for, 9-334  
   Holland, 6-\*351  
   ice cream, 9-338  
   milk, 9-331-32, †335, 338  
   Minnesota, 8-\*194  
   modern methods, 9-335, †336-37  
   New Jersey, 8-245, \*247  
   Shetland cows, 6-486  
   Vermont, 8-403  
   Wisconsin, 8-\*442, †443, 444  
   yield of milk and butter fat, 9-332  
   *see also* Cattle, dairying  
**Daisy**, flower, 2-174, \*182  
**Daisy (sunflower) family**, 2-\*174, 175  
**"Dakota,"** meaning, 8-302-A  
**Dakota, Lake**, prehistoric lake, 8-364  
**Dakota, Territory of**, 8-200  
**Dakota Indians**, *see* Sioux Indians

**Dakota River**, *see* James River  
**Dakotas**, states, U. S.  
   division, 8-300  
   name, 8-302-A  
   similarity of two states, 8-358  
   *see also* North Dakota; South Dakota  
**Daladier, Edouard**, French premier, 6-202  
**Dalai Lama**, ruler of Tibet, 5-439, 441  
**Dalecarlia**, Sweden, peasant life, 6-\*398 fol.  
**Dalhousie University**, Halifax, N. S., 7-29-N  
**Dallas, George M.**, vice president of the United States, 12-456-F  
**Dallas, Texas**, 8-†378  
   industries, 8-385  
**Dallis, Cyrus E.**, statue by, 11-\*376  
**Dalmatia**, prov., Europe, 6-310  
   Yugoslavia's dispute over, 6-364  
**Dalmatian** (plum-pudding dog), 4-\*499, 503  
**Dalmatian Alps**, mts., Europe, 6-364  
**Dalrymple, Alexander**, 13-506  
**Dalton, John**, life and work, main article, 13-†382-83; portrait, 13-\*383  
   atomic theory, 13-383  
   color blindness, 2-299; 13-383  
   discovers law of definite proportions, 1-283  
**Daman**, seaport, India, 5-336-D  
**Damascene work**, 12-80, 180  
**Damascus**, capital of Syria, 5-91, \*108  
   capital of Moslem empire, 5-398  
**Damask rose**, perfume from, 9-300  
**"Dame Holle,"** fairy tale, text, 14-†199-200  
   color plate, 14-\*200  
**"Damnation of Faust, The,"** by Berlioz, 13-306  
**Dampier, William**, explores Australia, 5-546-47  
**Dams**, construction, 1-†360  
   Ankara, 5-\*414-A  
   Arrowrock Dam, Idaho, 8-\*88; 10-531  
   Aswan Dam, Egypt, 10-529, \*532; 1-\*366  
   Bagnell Dam, Mo., 8-\*209  
   beaver, 4-†374-76  
   check dams built by farmers, 7-470  
   Coolidge Dam, Arizona, 10-\*531  
   Croton Dam, New York, 10-\*539  
   Dnieper, Russia, 6-\*522  
   Elephant Butte Dam, New Mexico, 8-\*382; 10-531  
   for irrigation systems, 10-\*528, †529 fol.  
   Fort Peck, in Montana, 8-220-A  
   Gatun Dam, Panama, 10-273  
   Hoover Dam, Nevada, 8-234, \*22; 10-531, †532; 1-370  
   Magnitogorsk, Russia, 6-\*440

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Dams—continued**

- Norris Dam, Tenn., 8-**\*368**  
 Roosevelt Dam, Arizona, 10-**\*528**  
 Shasta, 7-**\*469**  
 Shoshone, 8-**\*451**  
 Tennessee, 8-†**368**, 371-72  
 Washington, 8-428-A

**Damsel fly**, 3-†**391****Dan River**, Virginia and N. Carolina, 8-418, 296**Danaides**, mythology, 14-456**Danbury**, Conn., 8-60**"Dance, The"**

- painting by Watteau, 11-**\*279**  
 plaque from Radio City Music Hall, 12-**\*325**  
 sculpture by Carpeaux, 11-342, **\*343**

**Dance music**, 12-240, 253**Dancer**, bird, 4-179**"Dancer, The,"** painting by Renoir, 11-**\*3rd**  
 color plate following 360**Dancing**

- American Indian, 7-**\*96**, **\*97**, 104; 8-441  
 ballet, in opera, 12-227  
 Belgian Congo, 12-**\*329**  
 birds, 4-178, 179, 183, 234, 238  
 ceremonial, 12-324  
 folk dancing  
   Estonia, 6-**\*463**  
   Pacific islands, 5-**\*521**, 523, **\*524**  
   Samoa, 8-471  
   Sweden, 6-**\*404**  
 hula dance, 8-457  
 relation of music to, 12-202, **\*203**, 327  
 Spanish fandango, 7-**\*234**

**"Dancing gems,"** humming birds, 4-177**"Dancing Girl,"** statue by Crawford, 11-**\*375****Dancy**, tangerine, 9-173**Dandelion**, plant

- fruits, 2-**\*211**, 251, **\*120**, **\*127**  
 generic name, 2-183

**Dandolo**, Enrico, doge of Venice, 11-81**Danegeld**, tribute money, 6-12**Danelaw**, Danes' portion of England, 6-12**Danes**

- England, 6-†10 fol., 20  
 Ireland, 6-146  
*see also* Denmark

**Danevirke** (Danes' Work), ancient wall, 6-409**Danger**, how to meet, *see* Public safety**Danger zone**, when driving automobile, 2-†437-38**Daniel**, Hebrew prophet

- in the lions' den, 5-**\*128**  
 interprets the writing on the wall, 5-**\*128**

**"Daniel Deronda,"** by George Eliot, 13-261**Daniels**, Josephus, portrait, 12-**\*549****Danish language**, influence on English, 10-10**Dannebrog**, Danish flag, 6-410**Dante Alighieri**, life, main article, 13-†59-61; 6-299

- and Virgil in painting by Corot, 11-**\*328**  
 "Divine Comedy," 13-61  
 friendship for Giotto, 11-119

**Dante Alighieri—continued**

- portraits, 11-**\*114**; 13-**\*61**  
 quoted, 13-9  
 writes in mother tongue, 6-299; 13-61

**Danton, Georges Jacques**, leads insurrection in Paris, 6-192**Danube River**, Europe, S. W. Germany to Black Sea, 10-259

- Austria, 6-265  
 basin area, 10-257  
 Hungary, 6-290-B  
 length, 10-253  
 maps, 6-571, 583, 586, 594  
 outermost frontier of Roman world, 6-258  
 Roumania, 6-368 B  
 source, 6-241-B

**Danville**, Va., 8-417**Danzig, Free City of**, Europe, between World Wars, 6-468

## German attitude toward, 6-454

## won for Poland, 6-448

*see also* index preceding article on World War II, 6-493**Danzig, Gulf of**, Europe, map, 6-583**Daphne**, mythology

- aided by Diana, 14-456  
 and Apollo, 14-**\*439**, 440

**Daranyi, Koloman**, 6-290**D'Arc, Jeanne**, *see* Joan of Arc**Dardanelles**, strait, Turkey, map, 6-595, *see also* Hellespont**Dare, Ananias**, father of Virginia Dare, 8-286**Dare, Eleanor**, daughter of Governor White, 8-286**Dare, Virginia**, first English child born in America, 8-286**Dar-el-Beida**, *see* Casablanca**Dar es Salaam**, capital of Tanganyika Territory, Africa, 5-464**Darien, Gulf of**, between Colombia and Panama, map, 7-599**Darien, Isthmus of**, Central America

- Balboa governor of, 13-458  
 Balboa's discovery, 7-117  
 De Soto in, 13-464  
 Scottish colony, 6-129

**Darius I, the Great**, king of Persia

- divided country into satrapies, 5-103  
 inscription, 5-104  
 invasions of Greece, 5-162, 163  
 method of communication, 10-31  
 quoted, 5-105; 10-**\*424**  
 seal, 12-**\*106**

tiles from palace at Susa, 11-**\*27**, 28**Darius III**, king of Persia

- Alexander the Great receives family of, 5-**\*105**; 12-**\*348**  
 defeated by Alexander, 5-178; 12-349

**Dark Ages**, 5-266; 11-452; *see also* Middle Ages**Dark Caucasians** in Africa, 5-445

## Nigeria, 5-472

## Somaliland, 5-458

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Dark Caucasians—continued**

- Tuaregs of Sudan, 5-473  
 Uganda, 5-462
- Dark Continent**, why Africa so called, 5-443;  
*see also* Africa
- Dark room**, photography, 10-451
- Dark Rosaleen**, poetic name for Ireland, 6-151
- Darling River**, Queensland and New South  
 Wales, Australia; flows into Murray River,  
 5-550  
 length, 10-253  
 map, 5-601
- Darlington and Stockton railway line**, 10-179
- Darning**, 10-\*338
- Darning needle**, insect, 3-384, \*386, 387, 390
- Darnley, Henry Stewart, Lord**, consort of Mary  
 Stuart, 12-†398 fol.
- D'Artagnan**, *see* Artagnan, d'
- Darters**, fishes, 3-226, 236
- Dartmoor**, English moor, 6-108-B
- Dartmouth College**, Hanover, N. H., 8-242
- Dartmouth College case**, Webster's speech, 12-  
 523
- Darwin, Charles Robert, biography**, main article,  
 13-†434-37  
 and Lycii, 13-431  
 cited, 2-36; 3-291  
 evolution theory, 13-434, 436; 2-319  
 on flight of condors, 4-161  
 portrait, 13-\*434  
 "The Movements and Habits of Climbing  
 Plants," 2-155
- Darwin, Emma Wedgewood** (Mrs. Charles  
 Darwin), 13-435
- Darwin Harbor**, Falkland Islands, 6-\*492
- Darwin tulip**, 2-230
- Dasyures**, Australian tiger cats, 4-463
- Date**, oldest in history, 5-49, 10-477
- Date Line, International**, 10-†470-72
- Date palms**, 9-†190 fol.  
 grown in Irak, 5-80
- Date shell**, mollusk, 3-156
- Dates**, fruit, 2-\*119, 9-\*188, 190
- Dato**, Philippine chief, 5-563
- "Dauber,"** by Masfield, 13-270
- Daudet, Alphonse, life and works**, 13-133  
 portrait, 13-\*133
- Daumier Honoré**, life and art, 11-334  
 art style, 11-331, 335  
 friend of Delacroix, 11-329  
 "Laundress," painting, 11-\*331  
 refuses Legion of Honor decoration, 11-338
- Dauphin Island, Ala.**, 8-7
- David**, king of Israel, 5-\*122, 123  
 and Goliath, 5-\*122, 123; 9-77  
 painted by Blake, 13-\*211  
 statues  
 Bernini, 11-\*183  
 Donatello, 11-128, \*129  
 Michelangelo, 11-\*155  
 Verrocchio, 11-\*143, 144  
 story of harp, 12-203

- David I**, king of Scotland, reign, 6-111, 112  
 Holyrood House built by, 6-120
- David II**, king of Scotland, life, 6-116, \*115
- David, Gerard**, painting, 11-\*color plate fol. 360
- David, Jaques Louis**, art of, 11-289  
 "Coronation of Napoleon I and the Empress  
 Josephine, The," 11-\*287  
 defied by Romantics, 11-326  
 Influence, 11-288, 289, 291  
 "Portrait of Madame Récamier," 11-\*287  
 "David," Confederate submarine, 10-308  
 "David Copperfield," by Dickens, 13-242, 245
- Davie, William R.**, 12-496
- Davies, Arthur B.**, art style, 11-\*389  
 "Italian Landscape," painting, 11-\*389
- Davies, John**, Welsh dictionary, 6-141
- Davies, Richard**, Welsh edition of Bible, 6-140
- Davies Direct Primary Election Law**, 8-156
- Davis, Dwight F.**, 14-470
- Davis, Jefferson**, president of the Confederate  
 States of America, 7-250  
 birthday: observed as holiday, 8-386-A  
 birthplace: monument to, 8-\*135  
 capture, 8-81  
 home, 8-\*202
- Davis, John**, voyages, 13-496
- Davis, John W.**, presidential candidate, 7-332
- Davis cup**, tennis championship award, 1-218;  
 14-466
- Davis Strait**, No. America  
 how named, 13-496  
 icebergs, 1-63  
 maps, 7-593, 590; 13-502-A
- Davison, William**, imprisoned by Queen Eliza-  
 beth, 6-55
- Davy, Sir Humphry, life and work**, main article,  
 13-†383-85  
 and Faraday, 1-503; 13-386  
 invents safety lamp, 9-442  
 isolates sodium, 1-500  
 portrait, 13-\*384
- Davydd ap Gwilyn**, Welsh poet, 6-139
- Dawes, Charles**, vice president of the United  
 States, 12-456-F
- Dawes, William**, and Battle of Lexington, 7-164
- Dawes Plan**, for German reparations, 6-239;  
 12-456-F
- Dawn**, dependent on atmosphere, 1-140  
 goddess of; *see* Aurora
- Dawn and Evening**, sculpture by Michelangelo,  
 11-\*159
- Dawson Pact**, between Nicaragua and United  
 States, 7-47
- Day**, how reckoned, 10-470, 473  
 length of  
 earth, 1-†201-3; 2-222; 10-\*469  
 effect on plants, 2-222, 223  
 Jupiter, 1-154  
 lunar, 1-140  
 Mars, 1-150  
 Mercury; same as year, 1-146  
 Saturn, 1-157

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Day**, length of—*continued*  
 Uranus, 1-158  
 Venus, 1-148  
 names of days and their origin, 10-483  
 reckoned from noon at Greenwich, 10-470  
 rhyme for remembering number of days in months, 10-482  
 Sabbath, 7-610  
 sidereal, 1-186  
 when it begins, 10-470  
*see also* Calendar; Holidays; Months
- Day lily**, leaf, 2-\*144
- Daylight lamp**, 1-440
- Daytona Beach**, Fla., speedway, 8-76-A
- DC-6**, passenger plane, 10-326
- D. C. current**, *see* Direct current
- DDT**, insecticide, 2-\*136
- "De Amicitia,"** by Cicero, quotation from, 8-296-A
- "De Rerum Naturae,"** by Lucretius, quotation from, 8-262-A
- "Deacon Samuel Chapin,"** statue by St. Gaudens, 11-\*376
- Deacon seat**, in logging camp, 9-246, \*248
- "Deacon's Masterpiece . . ."** by Oliver Wendell Holmes, 13-309
- Dead**, Disposal of, *see* Burial of Dead; Mummies
- Dead Letter Office**, 10-\*84, 91
- Dead Sea**, Palestine, description, 1-92  
 buoyancy, 1-473  
 feet below sea level, 1-25  
 gypsum in, 1-54  
 map, 5-582, C4  
 salt in, 1-44; 9-411, 412
- Deadly nightshade**, plant, 9-145, 219
- Deaf**, theater telephones for, 11-510
- Deaf-mutes**  
 alphabet, 10-\*6  
 attitude toward, 12-568  
 Helen Keller, 12-+567-68  
 modern education, 7-443  
 taught by the Bells, 10-109, 111
- Deafness**, 2-304  
 caused by brain injury, 2-389
- Deák, Ferencz**, Hungarian statesman, 6-288
- Dean of American Letters**, title given William Dean Howells, 13-332
- Deans, Jeanie**, a Sir Walter Scott heroine, 13-222
- "Dear Brutus,"** by Barrie, 13-268
- "Dear Old Nebraska,"** song, 8-228-A
- Dearborn, Fort**, 12-\*519; 8-104
- Death**  
 abodes after death (mythology), 14-424  
 belief of New Guinea natives about, 5-526  
 Egyptian beliefs about, 5-54; 11-11
- "Death and Life,"** oratorio by Charles Gounod, 12-307
- "Death and Transfiguration,"** by Richard Strauss, 12-316
- Death camas**, plant, 2-205
- "Death Comes for the Archbishop,"** novel by Willa Cather, 13-352
- "Death of Nelson,"** painting by West, 11-312
- "Death of the Virgin,"** painting by Mantegna, 11-140
- "Death Staying the Hand of the Sculptor,"** by Daniel Chester French, 1-\*51
- Death Valley**, Calif., 7-419, \*416; 8-42; 1-\*195  
 deposits of borax and nitrate, 8-34  
 elevation, 1-25  
 lowest point, 8-33
- Death Valley National Monument**, 8-42-B
- Death's-head moth**, 3-\*286, 290
- De Beers Company**, mines, 9-430  
 diamond monopoly, 9-430
- Deborah**, song of, 5-120
- Debs, Eugene Victor**  
 leads Pullman strike, 7-290  
 pacifism and imprisonment, 7-322  
 presidential candidate, 7-305, 310, 311
- Debts, war**  
 international bank for handling payments, 7-527  
 United States, 7-339, 340
- Debussy, Claude Achille**, life and music, main article, 12-317-18, 253  
 music for "Pelléas and Mélisande" by, 13-100  
 portrait, 12-\*317  
 saxophone music written by, 12-258-E
- Debussy, Lily Texier**, wife of Claude Debussy, 12-318
- Decagon**, geometric figure, 10-439
- "Decameron,"** by Boccaccio, 13-64
- Decatur, Stephen**, 9-207
- Decatur, Ill.**, Lincoln's first home, 8-104
- Decay**, *see* Decomposition
- Deccan**, section of India, 5-387-A
- December**, tenth month, 10-482
- Decembrists, Russian**, 6-435
- Deciduous trees**, 2-\*270-76  
 deciduous conifer, 2-\*268  
 forests, 2-196  
 leaves, 2-\*25
- Deciliter**, 10-377
- Decimal system**, in measurement, 10-376-77, 423
- Decimals**, mathematics, 10-431
- Decimeter**, 10-377
- Decisions, legal**, 7-386
- Declaration of Independence, U. S.**, text, 7-172-73, †166  
 announcement of, 12-\*506  
 house in which written, 7-\*356  
 housed in Library of Congress, 10-555  
 John Adams' part in, 12-480  
 last to vote for, 8-342  
 read to public, 7-165  
 signing, 7-\*166; 12-\*463, \*505  
 facsimile of signatures, 12-\*481  
 Liberty Bell announces, 14-\*585  
 room where signing took place, 7-\*195

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Declaration of Independence—continued**

written by Thomas Jefferson, 12-503 fol.  
written with goose quill, 9-358

**Declaration of Independence, Women's, 7-244****Declaration of Indulgence, 1687, 6-128****Declaration of the Rights of Man, 6-191****"Decline and Fall of the Roman Empire, The,"**  
by Gibbon, 13-200**Decomposition**

brought about by fungi, 2-74, 76  
carbon dioxide result of, 2-40  
caused by bacteria, 2-18-21, 16, \*17  
heart rot in tree, 2-71  
new soil results from, 3-4

**Decompression chamber, for deep sea divers,**  
10-\*522, \*524**Decorated Gothic architecture, 11-474, \*475****Decoration and ornament**

arabesque, 11-242  
baskets, 12-\*128, †132  
bronze work, 12-16, 20, \*21, 180  
carving, 12-†94-107  
costume, 9-12  
furniture, 12-107, 194  
ancient, 12-176, \*178, †179, 180  
Byzantine, 12-181  
English, 12-\*185, 188 fol.  
Gothic, 12-182, 184  
modernistic, 12-199  
Renaissance, 12-\*183, 186 fol.  
Romanesque, 12-182  
gem carving, 12-†101 fol.  
geometric design, 12-\*47, \*49, 52  
glassware, 12-31  
gold and silver work, 12-80, 90  
ironwork, 12-\*5, †6, \*7, †8-10  
ivory carving, 12-†96 fol.  
jewelry, 12-†117-26  
laces, 12-164, 168  
mosaics, 11-†77-78; 12-110, 112  
pottery, 12-†46

**Decoration and ornament, architectural, 12-\*94**

bull's head and garlands, 5-\*4  
colored tiles, 9-379  
gargoyles, 11-†98-99, †470  
Gothic, 11-†474  
Greek, 11-†425  
use of, by Adam brothers, 12-\*192, 194  
Renaissance, 11-491  
*see also* Church decorations and ornament

**Decoration Day, 14-584****De Coverley, Sir Roger, *see* Coverley****"De Coverley Papers," 13-182****Deep-sea diving, 10-†521-26****"Deep Sea Rodeo," Mobile, Ala., 8-7****Deep-sea sounder, 10-\*105****Deer, animal, 4-†405 7, \*402, \*409, 412-13**

antelopes compared with, 4-415  
axis, 3-\*68; 4-\*402, \*413  
development of horns, 3-54  
Eld's deer, 4-\*409  
Florida, 4-\*409

**Deer continued**

giraffe compared with, 4-403

hangul deer, 4-\*474

India, 4-†412-13

Japanese sika, 4-\*409

marsh, 4-\*409

mule deer, 4-407, \*409

red, 4-\*412

sambar, 4-\*402, \*409

scent found in musk deer, 9-302

search for salt, 9-413, \*414

swamp, 4-\*402

Virginian deer, 4-\*402, 406

wapiti deer, 4-405, \*407, 412

wolf-hunted, 4-\*301

**Deer family, main article, 4-†402-13**

antelope's resemblance to, 4-415

antlers, 4-406, †408, 411, 415, \*421

caribou, 4-†411

giraffe, 4-†403-5

moose, 4-\*402, †407-11

okapi, 4-405, \*406

reindeer, 4-†411

*see also* Antelopes; Deer

**Deer Flat Bird Refuge, 8-92-A****Deere, John, plows, 7-452****Deerfield, Mass., Indian raid, 13-561****Deerfield River, U. S., 8-404****Deerlet (mouse deer), 4-413****Defense Bonds, U. S., 7-529****Defense Department, United States, 7-377****Deficiency diseases, 2-363, 364-65****Definite proportions, Law of, chemistry, 1-553,**  
555, 557

discovery, 1-283

**Defoe, Daniel, life and works, main article, 13-**  
†175-77; portrait, 13-\*176**De Forest, Lee**

improved its in vacuum tube, 10-118

telephone improved by, 10-113

**Deforestation, causes and effects, 2-241 fol.;**  
7-\*47, 468

drought causes, 7-465

Indiana, 8-112, 115

*see also* Reforestation

**Degas, Hilaire G. Edgar, paintings, 11-349**

"Dancers at Rest," 11-\*3rd color plate fol. 360

**De Gaulle, Charles, biography, 6-565****Degree, unit for measuring circle, 10-439****Dehiscent fruits, 2-122****Dehydrated Food, 9-231****Deianira and Nessus, mythology, 14-\*457****Deimos, moon of Mars, 1-151****Deimos, mythological character, 1-149****Deirdre, Irish heroine, 6-144****Deities, *see* Gods****De Kalb, Jean, aids American Revolution, 12-452****Dekaliter, 10-377****Dekameter, 10-377****De Koven, Reginald, music by, 8-428-A****De la Roche, Mazo, Canadian author, 7-29-1****Del Monte, Calif., fishing industry, 8-40**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Del Sarto, Andrea**, *see* Sarto, Andrea del
- Delacroix, Eugène**, life and art, 11-328-29  
 compared with Corot, 11-330  
 friend of Chopin, 12-292  
 leads Romantic movement in France, 11-325, 328  
 "Massacre at Chios," painting by, 11-\*323, 324, 328
- Delano, Jane A.**, portrait, 7-\*425
- Delarey, Jacob Hendrick**, Boer leader, 5-487
- Delaware**, state, United States, **description and history**, main article, 8-†63-66; general data, 8-66-A-66-B  
 agriculture, 8-65  
 fruit growing, 8-66  
 area, 8-66-A  
 capital, 8-63  
 charities and correction, 8-66-A  
 cities and towns, list, 8-66-B, 66  
 climate, 8-66-A  
 counties, list, 8-66-B  
 educational institutions, list, 8-66-A  
 flag, 8-66-A  
 history, 8-64-65  
 holidays observed, 8-66-A  
 Indians, 8-64  
 location, 8-66-A  
 map, 8-504  
   on United States map, 7-595  
 motto, 8-66-A  
 name, 8-66-A  
 nicknames, 8-66-A  
 physical characteristics, 8-64, 66-A  
 political facts, 8-66-A  
 products and industries, 8-65-66  
 reservations, game and bird, 8-66-A  
 state bird, 8-66-A  
 state flower, 8-66-A  
 state song, 8-66-A  
 Swedish settlements, 8-64; 7-†128  
 waterways, 8-66-A
- Delaware, University of**, at Newark, Delaware, 8-\*64, 66-A
- Delaware and Hudson Canal Company**, railway, 10-181
- Delaware Bay**  
 name, 8-66-A  
 once a river valley, 8-64  
 oysters, 8-247
- Delaware Indians**, 8-250  
 Ohio, 8-305  
 West Virginia, 8-432
- Delaware River**, U. S., 8-252  
 Delaware, 8-66-A  
 New York, 8-283  
 name, 8-64  
 Pennsylvania, 8-341  
 valley carved by, 8-250  
 Washington's crossing, 7-\*169, 170
- Delaware Water Gap**, 8-252, \*333
- De La Warr, Thomas West**, baron, 8-64, 66-A; 7-122
- "Delft, View of,"** painting by Vermeer, 11-†268
- Delft ware**, 12-58
- Delhi**, India  
 capital of the Slave Dynasty, 5-373  
 conquests of, 5-379  
 made capital, 5-386  
 sacked by Timur, 5-374
- "Delicious" apple**, monument to, 9-\*163
- Delilah and Samson**, story of, 5-\*121
- Delinquent boys and girls**, schools for, *see* sub-head charities and correction under names of various states
- Delius, Frederick**, 12-257
- Dell, Floyd**, author, "Moon Calf" by, 13-350
- Della Robbia, Andrea**, *see* Robbia, Andrea della
- Della Robbia, Luca**, *see* Robbia, Luca della
- Della Robbia**, colored glazes, 11-130
- Delmarva peninsula**, 8-162
- De Long, George Washington**, 13-499
- Delphi**, Greece  
 statues taken from, 12-16  
 temple  
   charioteer, statue, 11-\*39, 41  
   goldsmithery, 12-82  
   iron tripod, 12 3  
   thought to be at center of earth, 5-150
- Delphic oracle**, 5-\*148, 154  
 advice to Athens, 12-339  
 consulted by people, 14-443  
 declared Socrates to be wisest of men, 13-5  
 directs location of Byzantium, 5-404
- Delta of the Nile**, 5-48, 73-B  
 map, 5-578  
*see also* Nile River
- Deltoid**, muscle, 2-\*328
- Deluge**, biblical, 5-†76; 11-25
- Demarcation, Papal Line of**, 5-496
- Demavend**, mountain peak in Elburz Mountains, Persia, 5-106
- Demeter**, goddess, *see* Ceres
- Demobilization after World War I**, 7-331
- Democracy**  
 Athens, 5-167, 172; 7-348  
 difficulties encountered, 7-355  
 effect on Greek art, 11-38  
 France, 6-86  
 Great Britain almost complete democracy, 7-356  
 modern form of government, 7-357  
 personal responsibility for, 7-343  
 printing helps to bring about, 10-54  
 reflected in costumes, 9-20  
 Roman, 7-348  
 South America's obstacles to, 5-507  
 stand of European rulers against, 6-226, 228, 232, 268, 270  
 Switzerland, 6-254  
 the vote, 7-614  
 United States  
   before Civil War, 7-244  
   conflicting ideas of Hamilton and Jefferson, 7-192

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Democracy, United States--continued**

during early years of Republic, 7-177, 195, 199, 204, 223, 228

Jacksonian, 7-222

political and social reforms before World War, 7-308-12

Thomas Jefferson the father of American, 12-503, 504, 505

twentieth-century leaders, 7-305

Woodrow Wilson's strivings for, 12-548, 549, 552

writers who rooted for, 13-350

**Democratic National Convention, 7-\*369****Democratic party** (present party), principles, 7-228, 371

birth of, as Jacksonians, 7-222

captured by Populists and "free-silver" people, 7-292

considers Jefferson its founder, 7-371

control by Southern planters, 7-246

in 1930's and '40's, 7-†340-41, 341-B, 343 fol.

split between North and South, 7-250

status after Civil War, 7-285, 287

Wilson's leadership, 7-311-12, 320

**Democratic party** (Republicans)

descendant of Anti-Federalist party, 12-505

founded by Jefferson, 7-193

given name Republicans, 7-195

**Democratic Republicans, Jacksonian party, 7-222****"Democratic Vistas," by Whitman, 13-327****Democritus, Greek philosopher, atomic theory, 1-281, 532; 13-2****Demoiselle, fish, 3-196****Demon crab, 3-\*174, 180, 181****Demopolis, Ala., founding, 8-6****Demosthenes, life and orations, main article, 12-†344-45**

"Philippics," 5-177

suicide, 12-118

**Demotic writing, 10-\*41, 42****Denain, Siege of, 6-\*183****Denebola, star, star maps showing**

March and April, 1-178-D

May and June, 1-178-F

**Denham, friend of Franklin, 12-464****Denham, Dixon, explores Sahara, 5-453****Denison, Texas, 12-555-E****Denmark, country, Europe, description and history, main article, 6-†409-16; general data, 6-416-B**

Academy of Science, 6-415

American possessions, 7-33-N

area, 6-416-B

birds; storks, 4-197

climate, 6-416-B

Constitutions, 6-411, 416

education, 6-415, 416

Faroe Islands owned by, 6-486

flag, 6-410

color plate, 14-following 570, no. 18

**Denmark--continued**

government, 6-416-B

constitution by King Eric Glipping, 6-411

reforms of Valdemar Atterdag, 6-411

struggle between nobles and king for power, 6-412, 413, 414

Lex Regia or Royal Law, 6-415

reforms, 6-413, 415, 416

liberal constitution granted, 6-416

Greenland owned by, 6-482

haven for Jews, 5-137

history, 6-†409-16

England invaded, 6-\*10, †11 fol., 409, 410; 10-10

England's triumph over navy, 6-416

German invasion, 6-416

Kalmar Union of Scandinavian countries, 6-386, 396, 411, 412

nobles curbed by monarchy, 6-414

power during "Age of the Valdemars," 6-410

relations with Iceland, 6-416, 420

relations with Norway, 6-382, 386, 393, 409 fol.

loss of Norway, 6-407

relations with Schleswig-Holstein, 6-409, 411, 416

relations with Sweden, 6-397 fol., \*412, 413 fol.

Seven Years' War, 6-413

wars with Prussia, 6-409, 416

present status, 6-416

sells Virgin Islands to United States, 8-474

kitchen middens, 5-34

Knut the Holy, patron saint, 6-410

language; influence on English, 10-10

location, 6-416-B

maps, 6-598, 570

mistress of the northern seas, 6-389, 413

peasants, 6-412, 413, 415, 416

people, 6-416-B, 409

physical features, 6-416-B

pottery, 12-61

religious history, 6-409, 410, 413

Royal Copenhagen pottery, 12-\*60

serfdom, 6-412, 413, 416

sinking of coast, 1-70

trade, 6-†413, 416

Virgin Islands sold to U. S. 7-53

woman's suffrage granted, 12-572

see also index preceding article on World War II, 6-493

**Denmark Strait, maps, 13-502-A; 7-590****Denner, Johann Christopher, invention of clarinet, 12-258-A****Density, physics, 1-474****Dentatus, Manius Curius, refuses Samnite bribe, 5-\*222****Dentil, ornament, architecture, 11-\*418, \*425****Dentine of teeth, 2-\*313, 315****Dentistry,**

air pressure devices used in, 1-462, 464

X rays used in, 10-494

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Denver, Colo.**  
 climate, 8-52  
   temperature, 8-52-A  
 founded, 7-276  
 industries, 8-52  
 view of Denver, 8-\*49
- Denver, University of, Central City Play Festival, 8-52-A**
- Department stores, 7-538**  
 use of money carriers, 1-†463
- Departments, government, United States, 7-370, 373-81; see also names of individual departments, as Commerce, department of; Labor, department of**
- "Departure of Cleopatra, The," painting by Claude Lorrain, 11-\*238**
- Dephlogisticated air, 13-379**
- Deposit libraries, 10-558**
- Depressions, see Business cycle; Panics**
- Depretis, Agostino, Italian premier, 6-309**
- Depth vision, 2-434**
- De Quincey, Thomas, life, main article, 13-†232-33**  
 portrait, 13-\*233
- "Der Fuehrer (Adolph Hitler)," 6-\*240**
- Derain, André, landscape, painting by, 11-\*391**
- Dermis (corium), 2-287 fol.**  
 illustration, 2-\*288  
 part of skin used for leather, 9-67
- Dermot, MacMurrough, king of Leinster, 6-148**
- Derricks**  
 lumber camp, 9-\*253  
 oil fields, 9-†450 fol.; 8-\*383
- Dervishes, howling, 5-108**
- Descartes, René, life and philosophy, main article, 13-13-14**  
 algebra perfected by, 10-424  
 Blaise Pascal and, 13-\*108  
 ideas compared, 13-109  
 Christina of Sweden and, 6-401  
 portrait, 13-\*13  
 theory about solar system, 1-15
- "Descent from the Cross"**  
 carving, 12-\*101  
 stained glass window, 12-\*75  
 van der Weyden's painting, 11-\*197, 200
- "Descent of Man, The," by Charles Darwin, 13-437**
- Deschutes River, Oregon, 8-331**
- "Description of Greece," by Pausanias, 5-19**
- "Deseret," meaning, 8-396-A**
- Deseret, Mormon state, 8-393**
- Deseret State, nickname for Utah, 8-396-A**
- Desert**  
 Africa, 5-444, 448  
   Egypt, 5-73-B  
   Sahara, 5-†451, 452, 453, 454  
 animal life, Sahara, 5-453  
 cause of, 7-465-66  
 cause of dryness, 1-256  
 civilization, 1-195  
 Colorado desert, 1-\*95
- Desert--continued**  
 Death Valley, 7-\*416, 419  
 "dust bowl" regions of United States, 8-362-63  
 fighters, 6-\*539  
 food plants, 9-214, \*164  
 greatest, 5-452  
 irrigation, 10-†528-33  
 life in, 5-453  
 mirages, 1-†424, 426; 5-453  
 New Mexico, 8-256  
 oases, 5-453  
 only absolute, 2-197  
 temperature, Sahara, 5-453  
 transportation, Sahara, 5-453, 454  
 tribesmen of Arabia, 5-†421  
 vegetation, 2-†203-7, \*192, 197  
   Sahara, 5-453  
 whirlwind of sand, 5-73 B  
 winds and storms, 1-231, †232; 6-491  
 see also names of deserts, as Gobi
- Desert iguana, lizard, 3-\*452**
- Desert skink, lizard, 3-\*460**
- "Deserted Village, The," by Oliver Goldsmith, 13-\*197, 198**
- Deshima, island, Japan, Dutch trading post, 5-357**
- Design, decorative, see Decoration and ornament**
- Designs**  
 dress, 9-20  
 enameling; how applied, 12-63, 68  
 furniture, 12-194  
 Indian basket, 12-\*128, 132  
 pottery, 12-†47 fol.  
 rug, 12-†148 fol.  
 stained glass, 12-\*71, †73  
 tapestry, 12-138, 141, 142, 144; 11-308  
 transfer, 12-46  
 woven in color, 10-344
- "Desire Under the Elms," by O'Neill, 13-354**
- Desk set, type of telephone, 1-518**
- Desks, 12-181, 190, \*197**  
 how to make, 14-†50
- De Smet, Father Peter, gives first credited description of Yellowstone National Park region, 7-405**
- Des Moines, Iowa, 8-118**  
 becomes capital, 8-121  
 industries, 8-123  
 State Capitol, 8-\*118
- Des Moines River, U. S., rises in S. W. Minnesota, flows S. E. through Iowa to Mississippi River, 10-255, 8-124**
- Des Moines System, 8-124-A**  
 government, 8-124 A
- Desmond, Gerald Fitzgerald, Earl of, 6-\*151**
- De Soto, Hernando, adventures in the New World, 13-†464-66; 7-119**  
 Arkansas explored, 8-28  
 entertained by Tuscaloosa, 8-4  
 Louisiana, 8-141  
 Mississippi, 8-201  
 Tennessee, 8-367

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



- Despian, Charles**, use of bronze, 12-24  
**Des Plaines**, river, U. S., 8-106  
**Des Prés, Josquin**, composer, 12-216  
**Dessalines, Jean Jacques**, emperor of Haiti, 7-57  
**D'Este**, *see* Este  
**Destroyers**, war vessels, 7-485; 10-\*348  
     in World War service, 7-485; 6-\*519  
**Detroit**, Mich., 8-\*183  
     automobile plant, 8-\*184  
     founded, 8-181  
     Indian uprising, 7-10  
     industries, 8-185; 9-236  
     settlement, 7-6  
     strike center, 8-186  
     temperature, 8-186-A  
**Detroit River**, North America, 8-183, 185  
**Deucalion and Pyrrha**, mythology, 14-436  
**Deuterium**, isotope of hydrogen, 1-559  
**Deutsches Reich**, *see* Germany  
**De Valera, Eamon**, president of Irish Free State, 6-162  
**Devas** (Hindu spirits), hymns to, 5-368  
**Developing and printing**, photography, 10-\*450, †451  
**Development**, section of sonata-form in music, 12-236  
**Devil**, appearance in miracle plays, 12-327  
**Devil chasers of Tibet**, 5-\*440  
**Devil Dogs**, name for Marines, 7-490  
**Devilfish**, 3-200, \*201, *see also* Octopus; Squid  
**Devil's coach horse**, beetle, 3-337  
**Devil's darning needle**, fly, 3-384  
**Devil's Lake**, city, N. D., industries, 8-301  
     temperature, 1-210  
**Devil's Lake**, North Dakota, 8-302  
**Devil's Post Pile**, Calif., 7-417, \*418  
**Devil's Post Pile National Monument**, 8-42-B  
**Devil's Tower National Monument**, 8-454-A; 7-417, \*418  
**Devil's work balls**, Chinese carvings, 12-98  
**Devon cattle**, 9-332, \*333  
**Devonian period (Age of Fishes)**, 3-†21-24  
     forms of life in, table, 3-64  
     land animals, 3-23  
     plants, 3-\*22, \*23  
     sea creatures, 3-9, \*14, \*19  
     rocks, 1-†40  
**Devonshire**, county in S. W. England  
     lacemaking, 12-\*169  
     moorland, 6-108-B  
     rocks studied, 3-21  
**Devonshire, Duchess of**, portrait, 11-\*301  
**Dew**, 1-†240, \*241  
**Dew point**, 1-†240  
**Dewberry**, 9-158, \*159  
**De Wet, Christian Rudolf**, Boer leader, 5-487  
**Dewey, George**, life, main article, 12-†540-41  
     portrait, 12-\*540  
     victory at Manila Bay, 7-296, 297  
**Dewey, Melvin A.**, decimal system, 10-561-62  
**Dewey, Thomas E.**, 7-343, 343-B  
**Dewey decimal system**, 10-561-62
- De Witt Clinton**, locomotive, 10-\*182, 188, \*195  
**Dextrin**, sugar, 9-106  
**Dharma**, caste law of India, 5-369  
**Dhole**, wild dog, 4-306  
**Diabetes**, disease, 2-361  
     insulin a remedy, 10-550  
**Diablotin, Mont**, Dominica, West Indies, 7-64  
**"Dial, The,"** magazine of Transcendental Club, 13-305  
**Diameter of circle**, 10-438  
**Diamond**, a gem, 9-†429-31  
     cutting, 9-\*429, \*430; 12-126  
     discovery in South Africa, 5-†485  
     famous stones, 9-430; 12-120  
     found in meteorites, 1-166, 167  
     hardest substance, 9-422, 431  
     largest, 9-431  
     meaning of name, 9-431  
     mining, 9-†429  
     producing regions, 9-429  
         Arkansas, 8-29  
**Diamond**, baseball field, 14-\*506  
**Diamond-backed terrapin**, 3-\*478  
**Diamond bird**, 4-182  
**Diamond rattlesnake**, 3-492, \*493  
**Diamond saw**, 9-379  
**Diamond State** (Delaware), 8-66-A  
**Diana** (Artemis), goddess, 14-411  
     Arcthusa aided by, 14-\*435, 436  
     Daphne aided by, 14-441  
     daughter of Latonia, 14-457  
     love for Endymion, 14-\*455, 456  
     maiden, 14-456  
     name given to moon, 1-121  
     Niobe's daughters slain by, 14-458; 11-\*49, 50  
     Orion and, 14-\*418, 432  
     symbol of, in flags, 14-573  
     Temple at Ephesus, 5-185, \*186; 11-43, 52  
**"Diana Hunting,"** painting by Domenichino, 11-\*186  
**Diana monkey**, 4-253  
**"Diana of the Crossways,"** by Meredith, 13-263  
**Dianthus**, pinks, 2-230  
**Diaphone**, sound-making machine, 10-229  
**Diaphragm**, anatomy, 2-\*329, 337, \*352  
     formerly believed center of thinking, 13-4  
     hindered by tight clothing, 2-338  
**Diaphragm**, of camera, 2-296  
**Diaphragm**, of telephone, 1-\*518  
**"Diary of Samuel Pepys, The,"** 13-172  
**Diastole**, physiology, 2-373  
**Diathermy**, 10-303  
**Diatoms**, 3-\*13; 10-\*487  
     algae, 2-\*68, 69  
     chalk contains, 1-51, \*52  
     Ordovician period, 3-14  
**Diatryma**, prehistoric bird, 3-\*43  
**Diaulos**, musical instrument, 12-\*239  
**Diaz, Bartholomeu**, life, 13-456  
     rounds Cape of Good Hope 5-476; 7-113  
     seeks route to India, 13-504  
**Diaz, Porfirio**, president of Mexico, 7-86

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Diaz de Bivar, Ruy** (the Cid), 6-322  
**Dichnil**, Irish scholar, 6-146  
**Dickens, Charles**, life and works, main article, 13-†242-45  
     in America, 10-153  
     portrait, 13-\*243, \*244  
**Dickinson, Austin**, 13-322, 323  
**Dickinson, Edward**, 13-322  
**Dickinson, Emily**, life, main article, 13-†322-23  
**Dickinson, John**, American political writer and leader, 12-\*496  
**Dicotyledonous plants**, 2-129, 157  
     **Apetalae**, 2-†157-60  
     **Gamopetalae**, 2-†170-75  
     **Polypetalae**, 2-†162-68  
     stem, 2-†33  
**Dictatorships**, 7-554-55, 348  
     Brazil, 5-518-F  
     Fascism, 7-554  
     Germany, 6-240-41  
**Dictionary**  
     Dr. Johnson's, 13-195; 10-\*22  
     "New English," 10-25  
     Noah Webster's, 10-\*24  
     Welsh, 6-141  
     why a storybook, 10-17  
**Diderot, Denis**, life, main article, 13-119-20  
     Catherine the Great and, 12-417  
     Encyclopedia, 13-120  
     portrait, 13-\*119  
**Dido and Aeneas**, mythology, 14-\*433  
     Purcell's opera on, 12-227  
**Diego, Juan**, and Our Lady of Guadalupe, 7-81  
**Diego-Suarez**, Madagascar, 5-464  
**Diesel, Rudolf**, 10-276  
**Diesel engine**, 10-276  
     heavy creosote burned in, 9-447  
**Diesel locomotive**, 4 color plates opp. 10-174  
     diagram, 2nd and 3rd color plates opp. 10-174  
**Diet**, see Food  
**Diet of Worms**, 1122, 5-297  
**Diet of Worms**, 1521, 6-212; 13-544  
**Difference**, mathematics, 10-435  
**Differential of automobile**, 10-†290  
**Diffraction of light**, 1-\*423  
**Diffused light**, 1-428  
**Diffuser**, in beet-sugar making, 9-127  
**Diffusion**, physics, 1-361  
**Di-fluoro-dichloro-methane**, refrigerant, 1-408  
**Digby, Nova Scotia**, fisheries, 9-367  
     tides, 1-\*137  
**Digestion, process and organs of**, main article, 2-†352-58  
     color plate showing organs, 2-\*326  
     how flow of blood is controlled, 2-379  
     labeled diagram of organs, 2-\*352  
     see also Food; Nutrition  
**Digestion in plants**, 2-53  
**Digestive juices**, 2-355-57  
**Digestive tract** (alimentary canal), 2-\*352, 354  
**Digger Indians**, house, 7-\*101  
**Digger wasp**, 3-\*298, 307  
**Diggers**, people of Nevada, 8-234-B  
**Digitalis**, drug, 9-219  
**"Dignity and Impudence,"** painting by Sir Edward Landseer, 4-\*502  
**Dikes of Holland**, 6-352 fol.  
**Diliman fern**, 2-92  
**Dilley, Edgar M.**, composer of "Pennsylvania," 8-342  
**Dimitri**, grand duke of Moscow, 6-426  
**Dimitri**, son of Ivan the Terrible, 6-428  
**Dimitri the Pretender**, Russian czar, 6-428  
**Dinanderie**, bronze work, 12-22  
**Dinant**, Belgium, bronze work, 12-20  
**Dinaric Alps**, mts., Yugoslavia, map, 6-587  
**Dindings**, Straits Settlement, 5-426  
**D'Indy, Paul**, see Indy, Paul d'  
**Dingaan**, Zulu chief, 5-481, 482  
**Ding-dong theory** of language, 10-2  
**Dingley Tariff Act**, 12-456-D  
**Dingo**, wild dog, 4-307, \*308  
     poisoned for protection of sheep, 5-555  
**Dining car**, 10-\*197  
**Dining room**, modernistic, 12-\*174  
**Dining salon** of steamer, 10-296, \*301  
**Diniz**, king of Portugal, reign, 6-340  
**Dinosaur National Monument**, Utah, 8-396 A; 7-421  
**Dinosaurs**, prehistoric animals, main article, 3-†433-34, \*37, \*38, †40  
     disappearance, 3-48  
     eggs, 3-\*39  
     food of, 5-437  
     preserved in national monument, 7-421; 8-396-A  
**Dinotheres**, prehistoric animals, 3-56  
**Dinsmoor, W. B.**, archaeologist, 5-17, 18  
**Diocletian** (Gaius Aurelius Valerius Diocletianus), emperor of Rome, reign, 5-250  
     abdication, 5-252  
     persecution of Christians, 5-275  
**Diode tube**, electronics, 1-†560-62  
**Diogenes**, Greek philosopher, 13-†10  
**Diomedes**, Thracian king, horses, 14-\*426, 429  
**Dionysius**, tyrant of Syracuse, 5-160  
**Dionysus**, god, see Bacchus  
**Dionysus**, theater of, 5-\*159  
**Diorite**, stone  
     Hammurabi's code written on, 5-86  
     used in art, 11-19, 25  
**Diphda**, star, star maps showing:  
     Nov. and Dec., 1-178-I,  
     Sept. and Oct., 1-178-J  
**Diphtheria**  
     bacteria of, 2-\*14, \*19, 21  
     search for cure, 2-344  
**Diplococci**, bacteria, 2-\*14, \*17  
**Diplodocus**, prehistoric animal, 3-\*38, 40  
**Diplomatic officers**, U. S., 7-374  
**Dippers**, Big and Little, star groups, see Great Bear; Little Bear  
**Direct current**, electricity, 1-507, 516  
**Direct primary**, politics, 7-312

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Directoire furniture**, 12-192  
**Directors**, corporation, 7-580  
**Directory**, government of France, 6-\*193, 194  
**Directory Service of Post Office**, 10-90  
**Dirigibles**, 10-315, \*316, \*324  
   construction, 1-\*482  
   use, 10-362  
   World War I, 10-362; 7-\*327, 488  
   *see also* Airships  
**"Dirigo," motto of Maine**, 8-156-A  
**Dirk Hartog Island**, Western Australia  
   map, 5-600  
**Dis**, god, *see* Pluto  
**Disarmament**  
   Geneva Conference, 1933, 7-341-A  
   limitation of naval armaments, conferences,  
     7-484, 486  
   Soviet Russia's attitude toward, in 1928, 6-442  
   Washington Conference, 1921, 7-338  
**Discontinuous spectrum**, 1-187  
**Discordia (Eris)**, attendant on Mars, 1-149  
**"Discourse on the Sciences and the Arts," by** •  
   Rousseau, 13-19  
**Discoveries and inventions**, *see* Inventions  
**"Discovery," Captain Cook's ship**, 7-\*18  
**"Discovery," ship that brought first colonists**  
   to Virginia, 7-121  
**Discus throw**, sport, 14-\*475, 476  
**"Discus Thrower," sculpture by Myron**, 11-  
   37, \*38  
**Disease**  
   bacteria disclosed by microscope, 10-486 fol.  
   battle against, 7-307  
   carried by germs, 2-420  
   caused by animal germ carriers, 4-383  
   caused by bacteria, 2-†12 fol.  
   deficiency diseases  
     caused by lack of vitamins, 2-363  
     prevention and cure, 2-364-65  
   fight against, 7-423  
   germ theory studies of Behring and Metchnikoff, 2-344, 349  
   Hippocrates' study of, 13-357  
   how blood protects the body from, 2-344, 349  
   insect carriers of, 3-360, 365, 413  
   malarial fever, 3-\*156  
   menace to driving, 2-434  
   tropical, in Canal Zone, 7-307  
   water impurities a cause of, 10-553  
   *see also* names of diseases, as Anaemia; Hookworm  
**Diseases, plant**, main article, 2-†136-41  
   affecting wheat, 9-100  
**Dishes**  
   basketry, 12-132  
   modern glass, 12-36  
   Roman glass, 12-27  
   *see also* Porcelain; Pottery  
**Disinfectant**, salt used for, 9-414  
**Disk (tubular) flowers**, 2-175  
**Dislocations of bone**, treatment, 2-406, \*407  
**Dismal Swamp**, Virginia, 8-410, 415; 9-437  
**Disney, Walt**, movie producer, 10-†512-A-B  
**"Disorder and Early Sorrow," by Mann**, 13-  
   288  
**Displacement**, physics, main article, 1-†467-74  
**Disraeli, Benjamin, Earl of Beaconsfield**, life,  
   main article, 12-†439-41  
   at Congress of Berlin, 6-\*232  
   Gladstone's opposition to, 12-443  
   obtains control of Suez Canal, 12-441  
   policies, 6-99  
   portrait, 12-\*440  
   prime minister, 12-441  
**Disraeli, Isaac**, 12-439  
**"Disraeli," moving picture**, scenes from 12-  
   \*439, \*441  
**"Dissenters, The Shortest Way with," by De-**  
   foe, 13-175, 176  
**"Dissertation on Roast Pig, A," by Charles**  
   Lamb, 5-314; 13-224  
**Dissonance**, music, 12-223  
   used by Strauss, 12-315  
**Distaff**, use in spinning, 10-†340  
**Distance**, how to measure, 1-172  
**"Distant View of the Catskills," painting by**  
   John W. Casilear, 11-\*369  
**Distillation, fractional**, *see* Fractional distillation  
**Distribution of purchasing power**, economics,  
   7-567  
**District attorney**, state officer, 7-388  
**District governors**, system of, in empires, 5-103  
**District of Columbia**, Federal district, U. S.,  
   7-343-F; governing commission, 7-381  
   maps, 8-505; 7-118  
   slave trade abolished, 7-595  
**"Ditat Deus," motto of Arizona**, 8-24-A  
**Diu**, island, India, 5-336-D  
**Diver beetle**, 3-398  
   life cycle, 3-400  
**Dividends**, corporation, 7-527, 537  
**"Divine Comedy," by Dante**, 13-†60-61  
   Botticelli's illustrations, 11-147  
   significant of medieval beliefs, 6-299  
**Divine right of kings**, 7-353  
   England, 6-90 7-353; 12-409  
   France: Louis XIV, 7-354; 11-232  
**"Divine Shepherd, The," painting by Murillo**,  
   11-\*256  
**Diving and diving apparatus**, main article, 10-  
   †521-26  
   depths reached, 1-367  
   diving bell, 10-\*522 fol., 526  
   diving for pearls, 3-†162-64  
   record for divers, 10-526  
   safety precautions, 2-428  
   sponge gathering, 3-87  
   the sport, 14-†537-39  
   why breath stops when diving, 2-341  
**Divining rod**, 1-†90  
**Division**, mathematics, 10-430  
   algebra, 10-435  
**Division**, U. S. Army group, 7-476-77, 479-E

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Division of labor**, 7-†497  
interdependency of parts, 7-567-71  
shoe-making, 9-61  
specialization, 7-566
- Divorce**, prohibited in South Carolina, 8-356
- Dixon**, Ill., Indian mounds, 8-96
- Dixon Inlet**, or **Dixon Entrance**, a strait in North America, 8-16
- Dneprostroi dam**, *see* Dneiper Dam
- Dnieper**, river of Russia, 6-368; map, 6-601  
basin area, 10-257  
dam, 6-†522; 10-261  
length, 10-253  
outlet, 6-443-A  
Russia's engineering project, 10-261
- Dnepropetrovsk dam**, 10-261
- Dniester River**, Europe, Poland to Black Sea  
length, 10-253  
maps, 6-601, 594, 605
- Docks and harbors**, main article, 10-†244-50  
Duluth, Minn., 10-†260  
Göteborg, Sweden, 6-†403  
Hamburg, Germany, 6-†239  
Havana, Cuba, 7-†55  
Hongkong, 5-†332  
Maine, 8-†150  
Mobile, 8-†3  
New York City, 5-†184; 7-†510, †597; 10-†198  
"Old New York," 10-†216  
Rhodes, 6-†477  
St. John's, Newfoundland, 7-†31  
Virginia, 8-415
- "Doctor, The,"** painting, 2-†364
- "Doctor, The,"** series of writings by Southey, 13-220
- "Doctor Faustus, The Tragical History of,"**  
by Marlowe, 13-†162, 163
- "Doctor in Spite of Himself, The,"** by Molière, 13-112
- "Dr. Jekyll and Mr. Hyde,"** by Stevenson, 13-265
- Doctors**, *see* Physicians
- "Doctor's Dilemma, The,"** drama by George Bernard Shaw, 13-272
- Dodd, Mrs. John Bruce**, originates **Father's Day**, 14-584
- Dodder**, parasitic plant, 2-56, †57
- Dodgson, Charles Lutwidge**, *see* Carroll, Lewis
- Dodo**, extinct bird, 4-†239
- Dog**, domesticated, main article, 4-†490-503  
barking and howling, 4-498  
communication with one another, 10-†3  
descent from wolves and jackals, 4-494  
disposition compared with cat's, 4-483  
domestication, 4-307; 10-129  
first aid treatment, 2-†412  
French, German, Russian names for, 10-36  
heroes, 4-491, 503  
hunting; sense of scent, 4-501  
hydrophobia prevented by Pasteur, 13-369  
in Pompeii, 5-†258, 260  
inherited traits, 4-496
- Dog**—*continued*  
intelligence, 4-492, 501  
mosaic watchdogs of Romans, 12-†110, 111  
painting ("Saved"), by Sir Edwin Landseer, 3-†66  
scale drawing, 14-†64  
sense of smell, 2-308  
sense of sound, 2-302  
services to man, 4-492, 498, 501  
thinking power, 13-1  
tree trimmed in shape of, 2-†255  
types, 4-503  
used as beasts of burden, 6-†346, 348; 10-129, 130, †133  
*see also under names of dogs*, as Collie; Poodle
- Dog carts**, 6-†346, 348
- Dog-day harvest fly** (cicada), 3-373
- Dog-faced monkeys** (African baboons), 4-258
- Dog family**  
domesticated dog, *see* Dog, domesticated  
wild cousins of the dog, 4-†298-309  
coyote, 4-†298, 301  
fox, 4-†303-6  
hyena, 4-†307-9  
jackal, 4-†302  
wolf, 4-†298-302, 309
- Dog kennel**, how to make, 14-†42
- Dog of many parts**, game, 14-156
- Dog Star**, 1-170
- Dog towns, prairie**, 4-†370-71
- Doge**, official title, 6-297
- Doge of Venice**, Bellini's painting of, 11-†175
- Doge's Palace**, Venice, 11-†467, †487; 6-†303
- Dogfishes**, 3-198  
egg purses, 3-210  
teeth, 2-312
- Doggett, Thomas**, boat racing in England  
started by, 14-531
- Dogs, prairie**, 4-†370-71
- Dogs' Cemetery**, Paris, 4-503
- Dogtooth**, ornament, 11-†474
- Dogwood**, tree, 2-†276  
state flower of Virginia, 8-418-A  
state flower of North Carolina, 8-296-A
- Dogwood Festival**, Bristol, Va., 8-418-A
- Doldrums**, atmospheric zone at equator, 1-225  
effect upon rainfall, 1-256
- Dole, Sanford B.**, governor of Hawaii, 8-460
- Dole**, unemployment allowance, 7-544  
England, 6-102  
New Zealand, 5-541
- Dollar-a-year men**, 7-324
- Dollfuss, Engelbert**, Austrian chancellor, 6-275  
Nazis responsible for death, 6-241
- Dolls**, how to make, 14-†11  
furniture, how to make, 14-†31  
porcelain heads, 12-44
- "Doll's House, A,"** by Ibsen, 12-333
- Dolmers**, Scandinavian tombs, 6-†373
- Dolomite**, mineral, 9-422
- Dolores River**, U. S., 8-52 A

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Dolphin, constellation, star maps showing:**

July and August, 1-178-H

Nov. and Dec., 1-178-I.

Sept. and Oct., 1-178-J

**Dolphin, mammal, 4-448**\*descent from land-dwelling creatures, 4-442  
food, 4-445, 448**"Dombey and Son," by Dickens, 13-245****Dome, architecture, 11-407, †445 fol.**

Assyrian and Babylonian, 11-407

Capitol at Washington, 11-\*512

India, 11-\*453

Moorish, 11-449, \*450

Romanesque architecture, 11-455

St. Anthony, Padua, 11-449

St. Mark's, 11-448

St. Peter's at Rome, 11-†484

Santa Sophia, 11-\*445, 446

**Domenichino, painting by, 11-\*186****Domesday Book, 6-20****Domestic animals**domestication, 4-307; 6-\*464; 9-317, 318; .  
10-129

New Stone Age, 5-34

reindeer, 6-\*462

*see also names of animals, as Cats, Horses***"Domestic Symphony, The," by Strauss, 12-316****Dominant traits, heredity, 13-415****Domínguez Francisco Atanasio, Franciscan missionary-explorer, in Utah, 8-392****Dominic, Saint, Spanish friar, 5-†277****Dominica, island, West Indies, description, 7-64; general data, 7-54-B****Dominican Republic, West Indies, description and history, 7-58; general data, 7-54-A**

area, 7-54-A

climate, 7-54-A

flag, color plate, 14-following 570 no. 19

government, 7-54-A

Jewish refuge, 5-141

map, 7-601; location, 7-54-A

merchant marine, 10-232

people, 7-54-A

physical features, 7-54-A

products, 7-54-A

U. S. protectorate, 7-307

**Dominicans, religious order, 5-277****Dominion Day, Canada, 7-20****Dominion of Canada, *see* Canada****Dominions, British, definition, 7-33-A**  
government, 6-108-B**Domitian (Titus Flavius Domitianus Augustus), emperor of Rome, reign, 5-240**

fountain, Rome, 5-\*248

misrule, 13-54

**Domremy, France, Joan of Arc's birthplace, 12-385, 390****Don, river in Southern Russia, 10-261**

battle on, 6-426

length, 10-253

map, 6-601

outlet, 6-443-A

**Don, Battle of the, 6-426****"Don Carlos," drama by Schiller, 13-278****"Don Giovanni," opera by Mozart, 12-270**  
mandolin used in, 12-258-D

trombone used in, 12-258-B

**"Don Juan," poem by Byron, 13-227****"Don Juan," symphonic poem by Richard Strauss, 12-316****"Don Pasquale," opera by Donizetti, guitar part in, 12-258-D****"Don Quixote," novel by Cervantes, 13-\*73-76, 77****"Don Quixote," symphonic poem by Richard Strauss, 12-316****"Don Sebastian," play by John Dryden, 13-174****Donatello (Donato di Niccolò di Betto Bardi), sculptures, 11-†128-30, 138**

association with Brunelleschi, 11-126

genius, 11-129

goldsmithery, 12-88

returns farm to the Medici, 11-131

sculptures illustrated

"Annunciation," in Sante Croce, 11-\*130

"David," 11-\*129

"Gattamelata," 11-\*129

"Pumpkin Head," 11-\*129

"St. George," 11-\*129

"Singing Gallery," 11-\*130

studio, 11-\*128

**Donelson, Fort, General Grant's victory at, 7-\*262; 12-534****Donetz, river of Ukraine and Don region, Southern Soviet Russia to Don River, map, 6-601****Donetz River Basin, coal mines, 10-261****Donetz River Valley, Russia, coal, 6-368****Doni, Maddalena, portrait by Raphael, 11-166****Donizetti, Gaetano, 12-253**

"Don Pasquale" written by, 12-258-D

**Donjon, castle fortification, 5-\*304; 11-457****Donkey 4-350, 352, \*506, 508, \*509**

as beast of burden, 5-\*66, \*90, 6-\*313, \*330; 10-\*130, \*132

first butter maker, 9-\*341

member of horse tribe, 4-508, 8-350

milk, 9-332

used in railroad construction, 10-\*192

wild, 4-352, \*509

**Donkey, pinning tail to, game, 14-155****Donnacona, Indian chief, 13-474****Donne, John, 13-166**

metaphysical poet, 13-353

**Doolittle, Hilda, poet, 13-348, 349****Door knocker, bronze, 12-\*21****Doorbell, why it rings, 1-†490****Doormat, Egyptian, 12-\*148****Doorn, Holland, 6-355****Doors**

ironwork, 12-\*5

most beautiful in world, 12-22, \*23

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Doorways**  
 colonial, 11-\*503-4, 505  
 Notre Dame, 11-\*466  
 Romanesque, 11-\*452
- Dorcas gazelle**, 4-†420
- Dordogne**, France, picture writings, 10-35
- Dorians**, people, conquest of Greece, 5-152  
 Aegean civilization; art, 11-34  
 rule Sparta, 5-154
- Doric mode**, music, 12-208
- Doric Order**, architecture, 11-†418  
 Parthenon finest example, 5-169
- Doris**, district of Greece, on map, 5-\*150
- Dormancy in plants**, 2-†216-19  
 means of overcoming, 2-219  
 protective, 2-207
- Dormouse**, 4-384
- Dörpfeld, Wilhelm**, excavations at Troy, 5-17
- Dorsal nerves**, 2-\*393
- "Dos de Mayo,"** Spanish uprising, 6-†331
- Dos Passos, John**, author, 13-355
- Dostoyevsky, Feodor Michaelevitch**, life and works, main article, 13-93-95  
 attitude toward Turgeneff, 13-93  
 portrait, 13-\*94
- Double-action harp**, 12-258
- Double bass**, musical instrument, *see* Bass viol
- Double bassoon**, 12-258-A
- Double coconut**, 2-251, 263
- Double-collared sunbill**, bird, color plate, 4-\*185
- Double-crested cormorant**, bird, 4-\*212, 213  
 color plate, 4-\*152
- Double-cropping in truck gardens**, 9-154
- Double stars**, *see* Binary stars
- Doubleday, Abner**, invention of baseball, 8-282
- Doubt, River of**, *see* Roosevelt River
- Doughboys**, American soldiers in World War I, 7-\*319
- Douglas, Catherine**, Scotch heroine, 6-118
- Douglas, Sir James** (Black Douglas), 6-115  
 devotion to Robert Bruce, 12-383, 384
- Douglas, Sallie Hume**, song by, 8-92-B
- Douglas, Stephen Arnold**  
 debates with Lincoln, 12-531; 7-250  
 introduces Kansas-Nebraska bill, 7-248  
 pledges support to Lincoln, 7-255  
 presidential nominee, 7-250
- Douglas fir**, tree, 2-\*269; 7-29-W; 9-\*250  
 extreme age estimated, 2-260  
 wood, 9-258
- "Dove,"** boat bearing early settlers, 8-158
- Dove Cottage**, Wordsworth's home, 13-216, 233
- Dover, Del.**, capital, 8-63  
 colored college, 8-66-A  
 statehouse, 8-\*63
- Dover, N. H.**, early colony, 8-237
- Dover, N. J.**, temperature, 8-252
- Dover, Strait of**, Europe, maps, 6-573, 579, 570
- "Dover Beach,"** by Matthew Arnold, 13-256
- Doves**, birds, 4-79, †80, †144; *see also* Pigeons
- Down**, feathers, 4-12
- Down**, football term, 14-518
- Downing Street, No. 10**, residence of British prime minister, 6-\*106
- Downs**, of England, 6-108-B
- Downy mildew**, spray for, 2-140
- Downy woodpecker**, 4-†67, \*70  
 color plate, 4-\*88  
 year round visitor, 4-124
- Dowry**, Mohammedan custom, 5-419, 420
- Dowser**, underground springs located by, 1-†90
- "DoX,"** airplane, 10-327
- Draco**, Athenian legislator, 12-337
- Draft, military**  
 Civil War, 7-262  
 World War I, 7-322
- Dragon**, constellation, star maps showing:  
 Jan. and Feb., 1-178-A  
 July and August, 1-178-G  
 March and April, 1-178-C  
 May and June, 1-178-E  
 Nov. and Dec., 1-178-K  
 Sept. and Oct., 1-178-I
- Dragon, St. George and the**, 13-\*524, 525
- Dragon fly**, 3-†386, †387, 390, 391  
 beauty and lowly beginnings, 3-384, 387  
 life cycle, 3-†386, 390  
 not true fly, 3-357  
 water stage in growth of, 3-\*397
- Dragon-fly nymph**, 3-\*274
- Dragon lizard**, 3-†450
- Dragon ship**, of vikings, 10-\*164
- Dragon trees**, age, 2-259, 260
- Dragons**  
 Chinese mythology, 5-313  
 Chinese rug design, 12-150
- Dragon's teeth** sown by Cadmus, 14-450
- Drainage**  
 Holland's system, 6-352  
 in ancient Crete, 5-146  
 modern sewage systems, 7-397, †398  
 of irrigated lands, 6-352; 10-544  
*see also* Irrigation
- Drake, Edwin L.**, oil wells drilled by, 9-450
- Drake, Sir Francis**, biography, main article, 12-†403-5  
 defeats Spanish Armada, 12-405; 10-171  
 discovers California, 8-34; 7-121  
 explorations, 12-404  
 Oregon, 8-326  
 piracy, 12-394, 397, 404; 5-501; 7-81; 10-169  
 plunders Spanish possessions, 6-56  
 portrait, 12-\*405  
 voyage, 13-504
- Drake Strait**, So. Atlantic Ocean, map, 13-502-B
- Drama**, main article, 12-†324-34  
 American, 13-354-55  
 poetic, Edna St. Vincent Millay, 13-352  
 closely linked with song and dance, 12-327  
 English, 12-326-27, 329 fol.  
 birth of, 13-162  
 Elizabethan, 12-329-30  
 heroic plays by Dryden, 12-331  
 French, 12-330-31, 332

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Drama**—*continued*

greatest ever written, 13-157  
 Japanese, 5-<sup>\*</sup>350, 351  
 miracle plays, 12-326  
 motion picture plays, 10-†506-12, <sup>\*</sup>123, 124, <sup>\*</sup>126  
 plaque representing, 12-324  
 religious opposition to, 12-325  
 restoration, 13-174  
 social; Ibsen, 12-333  
 symbolic; Ibsen, 12-333  
*see also under* Comedy; Greek literature; Music  
 drama; Tragedy, and names of dramatists, as Molière; Shakespeare  
**"Dramatic Poesy, Essay of,"** by Dryden 13-174  
**Drapery**, in Greek sculpture, 11-<sup>\*</sup>39, <sup>\*</sup>41 fol.  
**Drave River**, Europe, rises in Tyrol, flows S. E. between Hungary and Yugoslavia into Danube  
 length, 10-253  
 map, 6-586  
**Dravidian tongues**, language group of Asia, 5-336-D  
**Dravidians**, race of India, 5-367, 368  
 physical characteristics, 5-336-D  
**Draw shots** billiards, 14-<sup>\*</sup>479, 481  
**Drawbridge** of castle, 5-†304; 10-356, <sup>\*</sup>361  
**Drawing**  
 how to draw to scale, 14-†59-69  
**Drawing a pig**, game, 14-157  
**Drawing room**, Pullman train, 10-193  
**Drawnwork**, embroidery; 12-164  
**"Dreadful Night,"** battle in Mexico, 13-470  
**Dreadnaughts**, battleships, 7-483  
**"Dream Children,"** by Charles Lamb, 13-224  
**"Dream Fugue,"** by De Quincey, 13-233  
**Drebbel, Van**, *see* Van Drebbel  
**Dred Scott Decision**, 7-250; 12-456-B  
**Dreiser, Theodore**, 13-346  
 period lived in, 7-335  
 Robinson Jeffers compared to, 13-353  
 style, 13-347  
**Dresden**, Germany, 10-257  
**Dresden porcelain**, 12-60  
**Dress**, *see* Clothing; Costume  
**Dresser, Paul**, Indiana state song composed by, 8-116-A  
**Dressoir**, medieval sideboard, 12-185  
**Dreyfus (Alfred) case**, 5-138  
**Dried foods**, 9-<sup>\*</sup>227, 228  
**Drift plain**, North Dakota, 8-298  
**Driftless region**, 8-119  
**Drill and tractor**, machine, 9-<sup>\*</sup>98  
**Drill monkeys**, 4-<sup>\*</sup>251  
**Drilling for oil**, 9-†449-55  
**Drinking contest**, game, 14-151  
**Drinking cups**  
 Greek, 12-<sup>\*</sup>49, 50  
 propelled by clockwork, 12-90  
**Drinking horns**, silver-mounted, 12-90  
**Drinks made of leaves**, 9-138  
**Drip coffee**, how made, 9-132

**Drive**, in golf, 14-<sup>\*</sup>496  
**Drive**, lumber, 9-<sup>\*</sup>249, †251  
**Driver**, golf club, 14-495, 497  
**Driver ant**, 3-326, 327  
**Driveshaft**, automobile, 10-288, †290  
**Driving**, main article, 2-432-47  
 carbon monoxide danger, 2-433  
 condition of automobile, 2-432  
 curves, 2-439, 440, 444  
 chart, 2-440  
 doctrine of "last clear chance," 2-446  
 first aid for accidents, 2-†399  
 gasoline consumption, chart, 2-†441  
 instruction, 2-<sup>\*</sup>433, <sup>\*</sup>435, 436, 447  
 intersections, 2-440, 441-42, <sup>\*</sup>444  
 night driving, 2-438-39, <sup>\*</sup>442  
 parking, 2-445  
 passing, 2-<sup>\*</sup>443, 444  
 railway crossings, 2-431, 445  
 right of way, 2-446  
 road signs, 2-443  
 signals, 2-442, 443  
 skidding, 2-440  
 stopping distances, table, 2-437  
 tests, 2-<sup>\*</sup>431  
 traffic lights, 2-442  
 turns, 2-442  
 diagram, 2-444  
**Drogheda**, Ireland, Cromwell at, 6-<sup>\*</sup>154  
**Dromedary**, camel, 4-<sup>\*</sup>397, 398  
**Dromia** (sleeping crab), 3-<sup>\*</sup>174  
**Drone**, pilotless plane, 7-488  
**Drone fly**, 3-365  
**Drones**, insects, *see* Ants; Bees  
**"Dropping the Pilot,"** cartoon, 6-<sup>\*</sup>233  
**Drosera** (sundew), plant, 2-†61  
**Drought**  
 Arkansas affected by, 8-30  
 Kansas, 8-130  
 plants' protection against, 2-207  
 ravages done by, 7-†465 fol.  
 South Dakota, 8-363  
 truck gardener's provision against, 9-153  
**Drowning**, rescue and first aid, 2-†408-10  
 caused by lack of oxygen, 2-338  
**Drugs**, *see* Medicine  
**"Druid,"** ship, sent to New Zealand, 5-534  
**Druids and Druidism**, 6-<sup>\*</sup>1, <sup>\*</sup>6, <sup>\*</sup>8; 14-586  
 Ireland, 6-†143  
 persecution of Christians, 6-<sup>\*</sup>110  
 poetry of, 6-144  
 superstitious celebrations, 14-586  
 temple at Stonehenge, 6-<sup>\*</sup>1, <sup>\*</sup>8; 10-<sup>\*</sup>483  
 Wales, 6-137  
**Druids of Eisteddfod**, Welsh bards, 6-<sup>\*</sup>136, <sup>\*</sup>140  
**Drum**, fish, 3-<sup>\*</sup>229  
**Drum**, musical instrument, 12-258-C  
 African, 12-<sup>\*</sup>202  
 Japanese, 12-<sup>\*</sup>225; 10-<sup>\*</sup>30  
 kettledrum, 12-258-C  
**Drum major**, 12-<sup>\*</sup>248  
**Drum taps**, signals, 10-29, <sup>\*</sup>30

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- "Drum Taps,"** by Walt Whitman, 13-327
- Drumhead**, cardrum, 2-304
- Drumlin**, oval hill, 8-439
- Drumming of ruffed grouse**, 4-79
- Drummond, William Henry**, Canadian poet, 7-29-H
- Drupes**, stone fruits, 2-120, †121
- Drury Lane**, theater, London, 12-331  
Sheridan's connection with, 13-†206 fol.
- Drushenikai**, Lithuania, radium, 6-464-B
- Dry cells**, electricity  
chemical action, 1-†497 fol.  
connection, 1-†517  
pressure furnished by, 1-510  
why they go dead, 1-500
- Dry-cleaning fluid**, 9-445
- Dry dock**, 10-249
- Dry farming**, 7-455  
dangers; Montana, 8-219  
Idaho, 8-92  
Oregon, 8-329  
Texas, 8-383
- Dry ice**, 10-519; 1-\*245, †406, 409
- Dry measure**, 10-375
- Dry point**, etching, 10-64
- Dry River**, Montana, 8-220
- Dry-store beetle**, 3-331
- Dry Tortuga Islands**, Florida, 8-76-A
- Dryads**, mythology, 14-437
- Dryden, John**, life and works, main article, 13-†173-74  
and Swift, 13-178  
drama, 13-174; 7-466  
opinion of Milton, 13-170  
portrait, 13-\*174  
translations, 13-174
- Dualism**, government, in Austria-Hungary, 6-288
- Dualism**, religion, 13-532
- Du Barry, Jeanne Bécu**, countess, 6-186
- Dubhe**, star, one of "Pointers," star maps showing:  
July and August, 1-178-G  
March and April, 1-178-C  
May and June, 1-178-E
- Dublin**, capital of Eire, 6-†162  
Abbey Theatre, 12-333  
average temperature and rainfall, 6-162-B  
Danish occupation, 6-146  
location, 6-162-B
- Dubois, Paul**, statue by, 11-\*375
- Dubuque, Julien**, pioneer settler of Iowa, 8-119
- Dubuque**, Iowa, 8-119  
founded, 8-121  
temperature, 8-124
- Duccio di Buoninsegna**, paintings by, 11-\*117, 120  
painting of three Marys, 11-\*117
- Duce**, II, *see* Mussolini, Benito
- Duchess lace**, 12-\*168
- Duck-billed platypus**, animal, 4-\*470, 471
- Duck hawk**, 4-\*155-56
- Duck on a rock**, game, 14-167
- Duck River**, Tennessee, 8-373
- Ducking for apples**, game, 14-160
- Ducks**, 4-†118-21  
color plate, 4-\*120  
domesticated, 9-\*353, 357  
drawing and mounting, 11-\*69  
eggs, 9-353, 358  
wild, 4-†118-21  
dabbling ducks, 4-118  
diving ducks, 4-119  
England, 4-175  
in streams and brooks, 3-223  
wood duck, 4-\*78, 79, color plate, \*120
- Ducks serious**, game, 14-169
- Duckweed**, (*Lemma*), 2-249
- Ductless glands**, 2-357
- Dudevant, Madame**, *see* Sand, George
- Dudley, Robert**, *see* Leicester, Robert Dudley, Earl of
- Dudley, Thomas**, governor of Massachusetts Bay Colony, ideas of, 8-167
- "Duet, The,"** painting by Gabriel Metsu, 11-\*260
- Dugong**, sea cow, 4-442
- Dugout**, boat, 10-†136 fol.; 7-98, \*99
- Dugout**, shelter  
Eskimo, 6-484  
Laplander, 9-\*377; 11-\*397  
refuge from tornadoes, 1-\*229
- Du Guesclin, Bertrand**, 6-174
- Duke, James B.**, endowment of Trinity College, 8-289
- Duke of Bridgewater Canal**, England, 10-186
- Duke University**, Durham, N. C., 8-289  
chapel, 8-\*289
- Dukhobors**, religious sect, 9-52
- Dulcimer**, musical instrument, 12-\*221, 258-D
- Dulis**, botany, defined, 2-184
- Du Lhut, Daniel Greysolon**, in Canada, 7-6
- Duluth**, Minn., 8-196  
a transit part, 10-247  
harbor, 8-\*192  
name, origin, 8-191
- "Dum Spiro, Spero,"** motto of South Carolina, 8-356-A
- Duma**, Russian parliament, 6-438, 439
- Dumas, Alexandre**, life and works, main article, 13-†128-29  
portrait, 13-\*129
- Dumb**, *see* Deaf-mutes
- Dumb cane**, plant, 2-151
- Dummer, Fort**, 8-399
- Dumont, Gabriel**, 7-26
- Duna**, river, Russia, *see* Don, river
- Dunart, Henri**  
originates Red Cross, 7-426, \*429
- Dunbar, William**, author of "Marriage of the Thistle and the Rose," 6-119
- Dunbar, Battle of**, 6-68; 13-408
- Duncan I**, king of Scotland, reign, 6-111
- Duncecap game**, 14-157

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



- "Dunciad, The," by Alexander Pope, 13-185  
**Dundee, Scotland**, jute manufacture, 10-237  
**Dunedin**, New Zealand, 5-539  
**Dungal**, Irish scholar, 6-146  
**Dungeness Spit Bird Refuge**, 8-428-A  
**Dunkirk**, British soldiers withdrawing, 6-508  
**Dunmore, John Murray, Lord**  
     Indians defeated by, 8-432  
     sends Daniel Boone into Kentucky, 12-471  
**Dunmore's War**, Indian campaign, 8-432  
**Dunstable, John**, 12-216  
**Duodecimal system**, 10-423  
**Duodenum**, of small intestine, 2-362  
**Dupin, Armatine Lucile Aurore**, *see* Sand, George  
**Dupleix, Joseph François**, marquis  
     opposed by Robert Clive, 6-80  
     power and influence in India, 5-381  
**Duplex system**, telegraphy, 10-99  
**Duquesne, Fort**, in Indian War, 7-143  
**Dura mater**, anatomy, 2-387, 394  
**Durango**, state, Mexico, map, 7-596  
**Durant, George**, early Carolina settler, 8-287, 288  
**Durant's Neck**, N. C., 8-287  
**Durban**, South Africa, 5-482  
**Dürer, Agnes** (Frau Albrecht Durer), 11-208  
**Dürer, Albrecht** life, main article, 11-†207-12  
     designs for jewelers, 12-125  
     engraving, 11-208, 212; 10-64  
     paintings  
         apostles, 11-210  
         Heronymus Holzschuher, portrait, 11-209  
         "Madonna and Child with St. Anne," 11-208  
         "Portrait of a Young Woman," 11-209  
         self-portraits, 11-208, 209  
     period in which he lived, 6-212  
     window designed by, 12-75  
**Durfee Hill**, mt., R. I., elevation, 8-347  
**Durham, John George Lambton**, earl, 7-17  
**Durham, N. C.**, Duke University, 8-289  
**Durian**, tropical fruit, 9-196  
**Duris**, Greek vase painter, 11-36  
**Durra**, cereal, 9-120  
**Durum**, variety of wheat, 9-102  
**D'Urville, Jules**, 13-508  
**Duryea, Charles E.**, gasoline car made by, 10-278  
**Duse, Eleonora**, Italian actress, 12-333  
**Dusseldorf**, Germany, industry, 10-257  
     map, 6-582, B3  
**Dust**  
     advantages and disadvantages of, 1-377  
     atmospheric content, 1-†219, 376, 377  
     causes condensation of moisture in air, 1-24  
     eye protected against, 2-†292, 300  
     lungs protected from, 2-336  
     meteoric, 1-117, 167  
     soil content, 1-96  
     why it floats, 1-473  
**Dust Bowl, American**, *see* American Dust Bowl  
**Dust storm**, 1-†232; 7-466  
     Oklahoma, 8-318  
**Dusty miller**, plant, 2-45  
**Dutch art**, *see* Dutch painting; Holland, arts and crafts  
**Dutch Belted cattle**, 9-332, 333  
**Dutch colonial life**, *see* Netherlands, colonization and exploration  
**Dutch dolls**, how to make, 14-†11  
**Dutch East India Company**, 5-378  
     goes bankrupt, 5-478  
     rule of African colonies, 5-477  
**Dutch East Indies**, 5-522, 523, 524; general data, 5-529-B  
     animal life, 3-461, 462  
     area, 5-529-B  
     climate, 5-529-B  
     Dyak native, 5-521  
     gems found in, 5-336-C  
     government, 5-529-B  
     independence, 6-562  
     location, 5-529-B  
     people, 5-529-B  
     physical features, 5-529-B  
     product and industries, 5-529-B, 9-208-9  
     volcanoes, 5-529-B  
**Dutch Guiana**, colony, So. Amer., 5-500, 512  
     bauxite in, 9-422  
     birds, 4-58  
     map, 5-603  
     *see also* Guiana  
**Dutch Harbor**, Alaska, 8-16-A  
**Dutch jumper**, how to make, 14-†33  
**Dutch New Guinea**, 5-525  
     area, 5-529-B  
     map, 5-507  
**Dutch painting**, main article, 11-†260-77  
**Dutch people**, and their history, *see* Belgium; Boers; Holland; Netherlands  
**Dutchman's-pipe**, vine, pollination, 2-106, 110  
**Duty**, customs, 7-513, 514  
**Duty**, in Stoic philosophy, 13-12  
**Duxbury, Mass.**, early homes, 11-497  
**"Duyfken"**, Dutch ship, 5-545  
**Dvina River**, in Northern Russia, included in Russia's waterway project, 10-253, 259  
     map, 6-600  
     outlet, 6-443-A  
**Dvořák, Anton**, life and works, main article, 12-†308-10, 256  
     portrait, 12-309  
**Dwarfs**, caused by hormone deficiency, 2-324  
     fairly tale, color plate, 14-176  
     *see also* Pigmies  
**Dwellings**, *see* Shelter  
**Dyaks**, people of Borneo, 5-425, 427, 521  
**Dyckman House**, New York City, 11-504  
**Dyes**, kinds and how obtained, main article, 9-†304-7  
     animal, 9-305  
     chemistry responsible for industry, 10-547  
     coal tar, 9-445, 446, 447  
     colors used in tapestry weaving, 12-141

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Dyes—continued**

- in oriental rugs, 12-157
- made with lichens, 2-80
- synthetic, 9-306, 445
- Tyrian purple, 5-\*111; 9-305
- used in basketry, 12-133
- used by Neolithic women, 5-38
- vegetable, 9-304

**Dynamite**

- ammonia (gelatin) dynamite, 10-418
- diatom shells ingredient of, 2-69
- explosion, 10-415, 417
- invention, 10-416
- use in guns, 10-360

**Dynamos, construction and operation, 1-\*502, \*506-8**

- armature and commutator, 1-\*502, 507
- comparison with motors, 1-527
- energy generated by, 1-\*345, 347, 506
- how driven, 1-\*345, 506, †508
- largest in world, 1-\*507

**"Dynasts, The," by Thomas Hardy, 13-265****Dynasty, ruling family, 5-59****Dysentery, caused by bacteria, 2-21****Dysprosium, element, symbol, atomic no., atomic wt., 1-\*551****Dythyramb, song honoring Bacchus, 12-324****E-flat Symphony, by Mozart, 12-258-R****"E Pluribus Unum," 8-302-A****E. Remington and Sons, typewriters, 10-64****Eagle, denomination of money, 10-375****Eagle, bird, 4-†151-52**

- color plate, 4-\*152
- fierce hunters of other animals, 4-†151
- nest building and breeding, 4-152
- number of species, 4-153
- Oligocene period; 3-53
- rare in England, 4-175
- see also names of varieties, as Bald eagle*

**Eagle, constellation, star maps showing:**

- Jan. and Feb., 1-178-A
- July and August, 1-178-H
- May and June, 1-178-F
- Nov. and Dec., 1-178-K, 178-L
- Sept. and Oct., 1-178-J

**Eagle, emblem**

- Mississippi, 8-206-A
- North Dakota flag, 8-302-A
- NRA symbol, 7-343
- Roman standards, 4-159
- United States, 4-151

**Eagle Badge, of Scouts, 14-543, 547****Eagle owl, 4-\*163, †167, 168****Eagle ray, fish, 3-200, \*201****Eagle River, Colo., 8-52-A****Eagle State, nickname for Mississippi, 8-206-A****Eagle's Nest, in Petrified Forest, 7-\*418****Eakins, Thomas, art style, 11-†356, 360**

- "The Thinker," painting, 11-\*356

**Ear shell, mollusk, 3-144****Eardrum, 2-†303, †304**

- muscles, 2-304

- precautions against bursting, 1-448

**Earhart, Amelia, portrait, 10-327****Earl, Mary, music of "Beautiful Ohio," 8-312-B****Early Iron Age, *see* Iron Age****Earrings, 12-\*117, \*118, \*119, \*123; 11-\*45****Ears, human, construction and hearing, main article, 2-†302-5****Ears—continued**

- effect of air pressure upon, 2-304
- hearing process, 1-†447, 448; 2-\*303, 305
- labyrinth, 2-\*282
- parts of ear, 2-\*284, \*303, \*304
- path of sound waves through, 2-\*303
- semicircular canals, 2-†282-85
- see also* Hearing

**Ears, of animals**

- ability to move, 2-302
- ears and ear holes of seal family, 4-332

**Earth, main article, 1-†51-54; table, 3-598 (*see also* Contents Volume 1)**

- age, 1-†43-44, 542; 3-8
- altitudes, table, 1-25
- atmosphere, 1-†372-77
- attraction, 1-16
- axis, 1-201, 203
- beginning of life on, 3-6, 9
- circumference, table, 1-106
- color plate, 1-98
- composition, 1-81, 109
- conductor of electricity, 1-514
- conductor of sound, 1-446
- considered center of universe, 1-100, 103; 13-393

**core, 1-32****crust**

- first crust; heat, 1-41
- formation of, 1-†38-41, \*8, 9; 3-†63
- lifting and sinking, 1-70
- shield from hot center, 1-48
- temperature variations, 1-†32
- thickness, 1-†31
- vibration, 1-82
- wrinkling, 3-†63

**day, table, 1-106****density or specific gravity, 1-474****diameter, table, 1-106****distance from sun, 1-14, \*112, †115, 289****distance through; equator and poles compared, 1-13****early beliefs about, 1-†100-3, 14**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Earth—continued**

effect of sun spots upon, 1-116  
 energy received from sun, 1-347  
 equinox and solstice, 1-203  
 exhaustion of fuel supply, 1-352  
 Geological eras and periods, 1-†40  
 gravitation, 1-14-16, \*301-3  
 heat of interior, 1-†31-36, 383  
 held in place by sun, 1-15  
 hemispheres, 5-518-B  
 ice ages, 1-61  
 latitude, 7-343-C  
 longitude, 10-473  
 magnetic force, 1-488  
 magnetic poles, 1-489  
 magnetic storms, 1-489  
 moon, distance from, 1-123  
 mountain formation, 1-†18-22  
 movement; position; shape; gravitation, 1-†13-16  
 movements  
   revolution around sun, 1-14, \*201, †202-3  
   rotation, 1-9, 202  
     affected by tides, 1-135  
     speed through space, 1-13, 286  
 orbit, 1-13, 173, 311  
 origin and formation, 1-†1-11  
   Nebular Hypothesis, 1-\*5, 6  
   Planetsimal Hypothesis, 1-9  
   tidal theory, 1-†7  
 perpetual motion impossible on, 1-319  
 place in solar system, color plate, 1-98; table, 1-106  
 poles, 1-16, 202  
 population, 1-13  
 precession of the equinoxes, 1-180  
 prehistoric weather conditions, 1-11, 196  
 roundness  
   efforts of Columbus to prove, 13-447  
   taught by Pythagoras, 13-4  
 satellites, table, 1-106  
 seasons, 1-†111, \*201, †202-3, †206, †208-10  
 seen from moon, 1-130, \*141  
 seen from sun, 1-105  
 shape, 1-13, \*103, 132  
 size, 1-13, \*16, 145  
   compared with planets, 1-†16  
   compared with sun, 1-110  
 solar system, part of, 1-105  
 source of economic wealth, 7-598; 12-53  
 specific gravity, 1-474  
 sunlight reflected by, 1-105  
 surface, nature of, 1-19, 20, 41  
 surface changes, 1-21; 13-430, 431  
   Turkestan, 5-435  
 tides, 1-133  
 Venus twin planet of, 1-148  
 water on, 1-11, \*363, 364; 3-62  
 weight, 1-16  
   compared with sun, 1-†112  
 what would happen if heated, 1-110  
 winds, 1-†227-32

**Earth—continued**

year, table, 1-106  
 zones, 1-204  
   temperate, 5-473-B  
*see also* Geology; Glacial epoch; Mountains; Ocean  
**Earth-monster**, mythological, 7-\*90  
**Earth nut**, peanut, 9-199  
**Earth pig**, *see* Aard-vark  
**Earth star**, fungus, 2-\*73  
**Earthenware**, *see* Pottery  
**Earthquakes**, main article, 1-†79-82  
   Central America, 7-44  
   Japan, 1-80; 5-364-B  
   recorded by seismograph, 1-\*81, 82  
   San Francisco, 1-†80  
   Sicily, 6-476  
   speed of waves through core of earth, 1-32  
   undersea, 1-80  
   West Indies, 7-64  
**Earthworm**  
   ability to grow new tail, 3-266  
   part played in soil formation, 1-97  
**Earwig**, insect, 3-355  
**East Africa**, description and history, main article, 5-†457-64  
   costume, 9-\*4  
   map, 5-576  
**East China Sea**, Asia, map, 5-591  
**East Goths**, *see* Ostrogoths  
**East Hampton**, Conn., 8-60  
**East Humboldt Mountains**, Nevada, 8-234-A  
**East India Company**, Dutch, 5-378, 477, 478  
**East India Company**, English, 5-378, 379, 382, 383  
   American tax on tea to aid, 7-161  
   St. Helena used by, 6-491  
**East India Company**, French, 5-379  
**East Indies** islands (Malay Archipelago), 5-†523-26, 529-B; 3-61; maps, 5-597, 573  
 animal life  
   birds, 4-180  
     cockatoo, 4-192  
     kingfisher, 4-50  
   chitagon or pigmy rhinoceros, 4-348  
   clams, 3-160  
   crocodile, 3-441  
   flying lemur, 4-276  
   lemur, 4-267  
   lizards, 3-450, 459  
   Malay bear, 4-318  
   python, 3-494  
   sea cucumbers, 3-139  
   tree shrew, 4-281  
 center of overland commerce, 5-544  
 minerals, 9-422; 5-\*529-A  
 native life, 5-\*521, \*522, †523 fol.  
 products and industries  
   oil, 9-453  
   Sisal, from Java, 9-285  
   spices, 9-208  
   tea, 9-135

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- East Indies**, products and industries—*continued*  
 tin, 9-420  
 tobacco, 9-223  
 rings used for passports, 12-117  
 trade, 10-237  
 volcano of Krakatoa, 1-76
- East Lansing**, Mich., agricultural college, 8-183
- East Liverpool**, Ohio, pottery, 8-311
- East Mark** (Austria), organized by Charlemagne, 6-258
- "East of Suez,"** meaning of phrase, 10-274
- East Peak**, Nevada, elevation, 8-234-A
- East Prussia**, prov., Prussia  
 amber, 9-314  
 map, 6-582
- East St. Louis**, Ill., manufactures, 8-104
- East Tennessee College**, *see* Tennessee, University of
- East Tennessee, Valley of**, 8-366, 373  
 climate, 8-373
- East Timbalier Bird Refuge**, 8-146-A
- Easter**, festival, observance, 14-581, \*582  
 dramatic entertainment, 12-326  
 Florida discovered, 8-69  
 "pasque" a word for, 8-364-A  
 probable German origin, 6-205  
 quarrel over calculation of date, 5-275, 276
- Easter eggs**, custom, 14-581  
 sugar filled, 9-123
- Easter Island**, Pacific Ocean, description, 5-529  
 stone images, 5-\*520, 521, 529
- Easter lily**, 2-\*147
- Eastern church**, *see* Greek Orthodox church
- Eastern empire**, *see* Byzantine empire
- Eastern Hemisphere**, 5-518-B
- Eastern Island**, one of Midway Islands, 8-464
- Eastern Shore**, peninsula, Maryland, 8-162-A  
 agriculture, 8-162, 414
- Eastern Standard Time**, 10-473
- Eastern Thrace**, formerly division of modern Greece, now European Turkey, 5-414-B
- Eastlake**, architect, responsibility for Gothic Revival in America, 11-512
- Eastman, George**, celluloid film originated by, 10-503
- Eastport**, Maine, factories, 8-154
- Eaves, swallows**, *see* Cliff swallows
- Ebabbara**, temple, 5-87
- Ebert, Friedrich**, president of Germany, 6-238  
 death, 6-240
- Ebony**, wood, 9-258
- Ebro River**, in N. E. Spain, from Catabrian Mts. to Mediterranean, 6-342-B  
 length, 10-253  
 map, 6-591
- Eccelino da Romano**, Italian tyrant, *see* Ezzelino Romano
- "Ecclesiastical History of England,"** by Bede, reproduction of page from, 13-†141
- Echidna** (porcupine anteater), 4-471, 472
- Echinoderms**, marine animals, 3-135
- Echinus**, architecture, 4-418
- Echo**, nymph, 14-\*440  
 and Narcissus, 14-\*441, 442
- "Echo and Narcissus,"** opera by Gluck, 12-272
- Echo or Celestial Organ**, 12-258-D
- Echo River**, Kentucky, cavern, 1-\*89, 92
- Echoes**, cause, 1-\*443, 446
- Eclipses**  
 how recorded, 1-188  
 Jupiter's moons, 1-155  
 moon, 1-125, †126, \*136  
 prediction by Thales?, 13-2  
 recorded in Indian calendar, 10-479  
 sun, 1-†108, †116-18, 188, \*204; 13-\*394
- Eclipsing binaries**, astronomy, 1-174
- Ecological botany**, 2-4
- Economic botany**, 2-2, 4
- Economic determinism**, 7-556
- Economic systems**, theories, 7-549
- Economics**, main article, 7-†495-587 (*see also* Contents Volume 7 and main subjects below)  
 Adam Smith's work, 13-20  
 banks and banking, 7-†516-23  
 barter, 7-502  
 business cycles, 7-†545-48  
 by-products, *see* By-products  
 capital, 7-537, 587  
 competition and monopoly, 7-538  
 corporations, 7-523-29  
 definition, 7-496  
 division of labor, 1-495 98, 502, 9-61  
 division of wealth, 7-†532-56  
 gold shipments; international trade payments, 7-†510-14  
 government control and ownership, 7-543, 549  
 importance of cotton crop, 9-29  
 importance of mechanical inventions and power, 7-498  
 Industrial Revolution, *see* Industrial Revolution  
 interdependence of nations in trade, 7-†565-78  
 "laissez faire," non-interference of government in business, 13-20
- Machine Age**, 6-84  
 mass consumption, 7-567  
 mass production, 7-566, 567  
 merchandizing methods, 7-538  
 money and its use, 7-†501-8  
 price, 7-532, 538  
 problem of farmer's crops, 8-121  
 overproduction partly absorbed by chemical industry, 10-546  
 profit and its sources, 7-533, 537  
 science of, defined, 7-496  
 stock exchange, 7-†580-87  
 utilitarianism, theory of John Stuart Mill, 13-239  
 wages, 7-533, 536, 540  
*see also* Taxation; Trade
- "Economist, The,"** British periodical, 13-25
- Ectoplasm**, in amoeba, 2-\*21
- Ector de Maris, Sir**, in Arthurian romances, 14-378, 394

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Ecuador**, country, So. Amer., description, 5-517;  
 general data, 5-518-F  
 area, 5-518-F  
 climate, 5-518-F  
 communication, 5-517  
 flag, color plate, 14-following 570, no. 20  
 forests and products of, 5-518-B  
 government, 5-518-F  
 history, 5-500, 507, 517  
 location, 5-518-F  
 map, 5-602  
 people, 5-518-F  
 physical features, 5-518-F  
 products and industries  
   chocolate, 9-\*177  
   panama hats, 9-90  
 rivers, 5-518-F
- Edam cheese**, 9-348
- Eddas**, Old Norse literature, 6-420  
 retelling of "Nibelungenlied" ("Saga of the  
   Volsungs"), 14-310
- Eddington**, Sir Arthur Stanley, theory of sun's  
 heat, 1-386
- Eddy**, Asa Gilbert, husband of Mary Baker Eddy,  
 13-557
- Eddy**, Mary Baker, life and beliefs, main article,  
 13-†555-58  
 portrait, 13-\*556
- Eddystone Lighthouse**, England, 12-†557
- Eden**, Robert Anthony, biography, 6-565
- Eden**, garden of, 5-119
- Edenton**, No. Car., 8-289
- Edenton Tea Party**, 8-291
- Edgar**, king of Scotland, 6-112
- Edict of Nantes**, *see* Nantes, Edict of
- Edict of Toleration**, act liberating Austrian Jews,  
 5-138
- Edinburgh**, Scotland, 6-126  
 Bruce grants privileges to, 6-\*115  
 center of learning, 6-132; 13-16, 21  
 map, 6-575
- Edinburgh Castle**, 6-126; 11-\*478
- "Edinburgh Review"**, periodical  
 Byron criticized by, 13-226  
 Macaulay's essays in, 13-234
- Edington**, Battle of, 6-†12
- Edison**, Thomas Alva, biography, main article,  
 13-†441-43  
 "Black Maria" moving-picture studio, 10-\*504  
 inventions  
   incandescent lamp, 1-525; 10-†392, \*393  
   moving-picture camera, 10-503  
   phonograph, 1-†443-45; 10-†497-500; 13-  
   442  
   telegaphy, 10-99; 13-442  
   telephony, 1-520; 10-113  
 laboratory, 10-\*392  
 model of first power house, 1-\*506  
 portraits, 1-\*444, \*524, \*535; 10-\*497; 13-\*442
- Edisto River**, South Carolina, 8-356
- "Editor, The"**, by Björnson, 13-99
- Ediz Hook Bird Refuge**, 8-428-A
- Edmonson County**, Kentucky  
 caves, 1-85  
 Echo River, 1-\*89
- Edmonton**, Alberta, Canada, 7-29-U
- Edmund II**, Ironside, king of West Saxons, 6-12
- Edom**, ancient people of Palestine, 5-124
- Education**  
 agricultural, 7-†456, 457  
 American Indians, 8-260  
 ancient Athens, 5-170  
 ancient Babylon, 5-86, 87  
 ancient Sparta, 5-155  
 Andrew Carnegie's gifts to, 12-566  
 before invention of printing, 10-48  
 Canada, 7-29-G, 29-R, 29-U  
 China, 5-326-27, 336  
 deaf, training of, 10-\*6, 109, 111  
 England  
   Matthew Arnold's service to, 13-254  
 Esthonia, 6-464  
 Iceland, 6-419  
 India, European influence, 5-386  
 libraries, 10-555-62  
 Middle Ages  
   art and learning, 11-84, 88  
   in castle, 5-306  
   importance of church, 5-278; *see also* Monk  
     and monasticism  
 Mohammedan, 5-419, 423  
   most widely educated nations, 6-460, 464  
 negro, 8-7, 417  
   college at Dover, Del., 8-66-A  
 Russia, 6-442-43  
 safety, 2-†423-48  
 schools  
   Aristotle's (Lyceum), 13-9  
   city systems, 7-400  
   county and town, 7-389  
   open air, 2-418, \*420; 5-\*452  
   Plato's Academy, 13-7  
   Pythagoras's, 13-4  
   Zeno's, 13-11  
 popular education affected by printing, 10-54  
 Soviet Russia, 6-443  
 Sweden, 6-407  
 Thomas Jefferson's work for, 12-504, 506  
 United States  
   military  
     army schools, 7-478  
     Marine Corps training, 7-490  
     Military Academy at West Point, 7-†476-  
       79  
     training of reserves, 7-475  
   naval  
     Naval Academy at Annapolis, 7-487  
     training of reserves, 7-487  
     *see also* education under each state  
   *see also* Colleges and universities: Teachers and  
   teaching; Vocational guidance  
**"Education"**, by Herbert Spencer, 13-25  
**"Education of a Christian Prince, The"**, by  
 Erasmus, 13-82

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- "Education of Henry Adams, The,"** by Henry Adams, 12-481
- Edward I, king of England, reign, 6-25**  
 conquest of Wales, 6-139  
 expels Jews from England, 5-136  
 relations with Scotland; makes Balliol king, 6-113  
 rule in Ireland, 6-149  
 wars with Scotland, 12-381-83
- Edward II, king of England, war against Scotland, 6-25, 115**
- Edward III, king of England, reign, 6-†25-28**  
 and the burghers of Calais, 11-348  
 Hundred Years' War, 6-172  
 relations with Chaucer, 13-143  
 relations with Scotland, 6-116  
 royal seal, 6-25
- Edward IV, king of England, reign, 6-39**  
 and William Caxton, 10-\*52, 54
- Edward V, king of England, 6-\*30, \*38, 39**
- Edward VI, king of England, reign, 6-†46**  
 relations with Scotland, 6-120
- Edward VII, king of England, 6-101, \*102**
- Edward VIII, king of England, 6-108**
- Edward the Confessor, king of the English, reign, 6-14**  
 builds Westminster Abbey, 11-472
- Edward (the Black Prince), prince of Wales**  
 death, 6-32  
 model of chivalry, 13-141  
 Poitiers, 6-27
- "Edward II,"** play, by Christopher Marlowe, 13-163
- Edward Augustus, Fort, Wisconsin, 8-441**
- Edwards, J. G., "Old Hawkeye,"** editor, 8-124-A
- Edwards, Jonathan, life and works, main article, 13-†291-92**
- Edwards Plateau, Texas, 8-377, 386**
- Edwin, king of Northumbria, 6-9**
- Edwin Bridge, Utah, 1-\*96**
- "Edwin Drood, The Mystery of,"** by Dickens, 13-245
- Eel pout, shellfish, 3-\*143**
- Eels, fishes, growth stages, 3-250, †251**
- Effective temperatures, 2-257**
- Efferent nerve, anatomy, 2-395**
- Efficiency engineer, duties, 2-426**
- Egbert, king of West Saxons, made ruler of all England, 6-11**
- Egeria, goddess, altar of, 14-\*415**
- Egg and dart, ornament, 11-\*425; 12-\*94**
- Egg cell, botany**  
 development of, in mosses, 2-\*83, 84  
 fern, 2-\*89
- Egg cell, zoölogy, of rabbit, 13-\*361**
- Eggplant, vegetable, 9-\*150**
- Eggs**  
 dinosaur, 3-\*39  
 duck, 9-358  
 Easter egg custom, 14-581  
 eaten by weasels, 4-355
- Eggs—continued**  
 fish, 3-245 fol.  
 hen  
     how to keep fresh, 9-†357  
     normal output; how increased, 9-354  
     test for freshness, 1-473  
 largest, compared with hens', 4-\*237  
 lobster, 3-\*186  
 mammals that lay eggs, 4-†471-72  
 ostrich, 4-232, \*237  
 virus injected into, 2-\*13  
 white of, 9-356  
 yolk, 9-356  
*see also* Eggs and hatching; Eggs as food
- Eggs and hatching**  
 birds, *see* Nest building and breeding of birds  
 crabs, 3-177  
 development, or life during hatching, 9-355  
 egg-laying mammals, 4-472  
 fishes, 3-208 fol., 227 fol., 242, 245 fol., †256, 260, 261  
 frogs and toads, 3-†417-20, †424-26  
 hens, hatching in incubators, 9-†355-56  
 insects  
     bee, 3-†300, 312, \*314, 315  
     beetle, 3-335  
         apple tree borer, 3-†343  
         boll weevil, 3-339  
         scarab, 3-332  
         scavenger, 3-†401  
     butterfly, 3-277, \*278  
     cicada (locust), 3-\*371, 372  
     cricket, 3-349  
     fly, 3-†358  
     gnat, 3-360  
     mosquito, 3-360, †363  
     wasp, 3-306  
 octopus, 3-169  
 oysters, 3-158  
 reptiles  
     crocodile, 3-\*436, 439  
     snakes, 3-\*493, \*497, 500, \*501  
     tortoises and turtles, 3-472, 478  
 shellfish, 3-148, †256, 260, 261  
 spiders, 3-†406, †407, \*413  
 William Harvey's studies, 13-†361
- Eggs as food, 9-352 fol.**
- Egmont, Mt., volcanic mt., New Zealand, 5-541-B**
- "Egoist, The,"** by George Meredith, 13-263
- Egrets, birds, 4-\*101, †140, †146**
- Egypt, ancient country, description and history, main article, 5-†47-73**  
 agriculture, 5-47; 7-\*452; *see also below* irrigation methods  
 archaeology  
     excavations, 5-†7 fol.  
     history revealed by, 5-10  
     Posetta Stone, 5-8; 10-\*41, 42  
     Tutankhamon's tomb, 5-†7 fol.; 12-120  
 architecture, 11-†409-13  
     capital, 12-\*94

**Egypt, ancient country, architecture—continued**  
 clearstories borrowed by Romans, 11-442  
 colossi, 5-†68  
 columns copied and enlarged upon by Greeks, 5-158  
 obelisks, 5-†63; 11-412  
   in Central Park, New York, 10-39  
 pyramids, 11-†409-11; 5-†52-55; *see also* Pyramids, Egyptian  
 Sphinx, 5-47, †55; 10-481  
 temples, 11-†411-13; 5-61, 63, \*66, 68, 69  
   of Ramses the Great, 11-400  
   paintings in, 12-176  
   wall inscriptions, 10-34, \*38, \*40  
 tombs, 11-†409-11  
   decorations and furnishings, 11-†10 fol., 409, \*412; 12-79, 176  
   excavation of Tutankhamon's, 5-7 fol., 64  
   for sacred bulls, 5-67  
   wall inscriptions, 10-34, \*40  
   wall paintings, 11-10; 12-26; 10-373  
   when and why built, 5-10, 54  
**art, 11-†6-20**  
   glory of eighteenth dynasty art, 11-16  
   Hellenistic influence, 5-181  
   new art of Amenhotep IV, 11-16  
   painting, 11-10 fol.; 12-26, 176  
   portrait busts, 11-18; 9-91  
   rules; centuries of sameness, 11-12, 14, 20  
   sculpture, 11-9 fol.  
   influence on Greek sculpture, 5-158  
 arts and ideas absorbed by Phoenicians, 5-111  
 astronomy, 1-100, \*101, 102, 177  
 beacon fires for seamen, 10-226  
 becomes center of Hellenistic culture, 5-181  
 boats, *see* Egypt, transportation  
 bread made in, 9-238, \*239, 240  
 Bronze Age, 12-13  
 burial of dead, *see* Burial of dead: Mummies, Pyramids; Tombs  
 burial of rulers, 5-12  
 calendar, 5-49, 51, 10-477, 480  
   year one, 5-49  
 canals, 5-56; 10-161, 166, 270  
 cattle, 9-331  
 climate, 12-106  
 communication by messengers, 10-85  
 costume, 9-5, \*6  
   headdresses, 9-91, 94  
   jewelry and makeup, 9-12  
   sandals, 9-58  
 cotton, 9-27, 32; 10-403, 404  
 crafts  
   basketwork, 12-130, \*131, 134  
   bronze work, 12-13, \*15; 11-8  
   carving, 12-99, 102, \*103, \*106; 11-15, \*17  
   earliest crafts, 5-49, \*50  
   enameling, 12-63, †64  
   furniture, 12-102, 176, \*177  
   glassmaking, 12-†26-27  
   goldsmithing and silversmithing, 12-79, \*80, 82

**Egypt, ancient country, crafts—continued**  
 ironwork, 12-2  
 jewelry, 12-117, †119-20; 11-15  
 lace, 12-164  
 mosaic inlay, 12-109  
 pottery, 12-41, \*44, †51, \*53, 54  
   ideas absorbed by Cretans, 12-48  
 rugs, 12-148, \*150  
 earliest peoples and their crafts, 5-49, \*50  
 fertilized by Nile, 5-455  
 first queen in history, 5-62  
 flag, color plate, 14-following 570, no. 21  
 history, 5-†47-66  
   Old Kingdom, 5-†47-56  
     beginning of, 5-42  
     kings, 5-51 fol.  
     earliest voyage around Africa, 5-446  
     divided into small districts, 5-49, 56  
     Upper and Lower Kingdoms united under first Pharaoh, 5-51-52, 54  
     Hittites supplied with iron, 5-115  
     sends King Solomon a wife, 5-69, 123  
     era of Old Kingdom, 5-58  
   Middle Kingdom, 5-†59-62  
     country divided into districts, 5-58, 61  
     rule of the Hyksos, or Shepherd Kings, 5-61  
     sources of income, 5-59  
     engineering triumphs on Nile, 5-60  
     war lords, 5-62  
     political unity under Theban kings, 5-59, 62  
   Empire, 5-62-64  
     Hatshepsut's expedition to Punt, 5-63  
     Ikhnoton most remarkable pharaoh, 5-64  
**after 1350 B. C., 5-†66-73**  
   Harmhab and the Ramses, 5-67  
   Libyan kings, 5-68  
   alliance with Hebrews, 5-126  
   Ethiopian and Assyrian rule, 5-69  
   Saitic period, 5-70  
   Assyrian conquest of, 5-92  
   aided by Greece in revolt against Persia, 5-169  
   Persian and later conquests, 5-72  
   Alexander of Macedon in, 12-349  
   becomes subject to Rome, 5-218  
   Cleopatra's reign, 12-†360  
 influence on Cretan culture, 5-144  
 iron nails, 9-401  
 irrigation methods, 10-528, \*532  
 knowledge of bone setting, 2-324  
 knowledge of geometry, 10-423  
 language and writing  
   alphabet, 5-111; 10-40  
   demotic writing, 10-41, 42  
   Hebrew words added to, 5-68  
   hieroglyphics, 10-†38  
     borrowed by Cretans, 5-144  
     numerals, 10-†421, \*422  
 library at Alexandria, 10-556

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Egypt, ancient country—continued**

- linens found in tombs, 9-46, †47
  - locust plagues, 3-369
  - map of ancient Oriental empires, 5-88
  - map of Old Kingdom, 5-48
  - music, 12-202, 204
  - New Year's day observed, 14-578
  - numerals, 10-†421, \*422
  - papyrus, 9-273, \*274; 10-\*34, 44
  - ropes made of, 9-284
  - people
    - physical characteristics, 5-49
    - racial origin, 5-49, 445
  - physical characteristics, 5-47, 48
  - plants grown by, 9-97, 168
  - religion, 5-49, †54, 55, 64, \*67, 69, 73; 11-409
  - animal worship
    - beetle, 3-329, †332
    - bull, 5-\*67
    - cat, 4-486
    - crocodile, 3-442
    - ibis, 4-148
  - beliefs about death, 5-54
  - cow goddess, 12-\*103
  - deities, 5-49, †54
  - sun worship, 5-49, 55
  - scarab beetle, 3-\*329, 331, †332
  - trade
    - Cretans, 5-144
    - Phoenicians, 5-109
    - promoted by pyramid building, 5-55
    - prospered under Psamitik I, 5-70
    - shipping, 10-161
  - transportation
    - boat, 10-\*140
    - funeral boat, 5-\*60
    - sailing vessels, 10-\*160, †161
    - wheeled vehicles, 10-143, 144
    - see also above subhead* canals
  - Upper and Lower kingdoms, 5-51
  - weights and measures, 10-371, \*373
  - writing, *see above subhead*, language and writing
  - see also* Egypt, modern country
- Egypt, modern country, description and history,**  
 5-\*66, 72-73; general data, 5-73-B
- agriculture, 5-73
  - animal life
    - birds
      - ibis, 4-148
      - plover, 3-442, \*443
      - vulture or pharaoh's chicken, 4-161
    - caraculs, 4-296
    - crocodiles, 3-\*439, \*441, 442, \*443
    - jerboas, 4-380
    - mongooses, 4-296
    - shrewmice, 4-281
  - area, 5-73-B
  - bread seller, 10-\*131
  - canals built, 10-\*166
  - climate, 5-73-B
  - deserts and oases, 5-73-B
  - eggs, method of hatching, 9-357

**Egypt, modern country—continued**

- fertilized by Nile, 5-455
  - flag, color plate, 14—following \*572
  - government, 5-73-B
  - history, 5-66, 72-73
    - Napoleon's campaign, 12-426
    - passes from Turkish to British rule, 5-414
    - Sudan ruled by England and Egypt, 5-455
    - after World War I, 5-73
  - irrigation, 10-\*532, 533
  - life m. pictured, 5-\*58, \*66, \*71, \*73
  - location, 5-73-B
  - maps, 5-578, 575
  - Mohammedans, 5-\*66, \*71, 73
  - natural resources, 5-73
  - one of the three independent states in Africa, 5-448
  - people, 5-73-B, 73
  - physical features, 5-73-B, 47, \*48
  - products and industries, 5-73
    - cotton, 9-27, 32
    - numerals, 5-73-B
    - sponge gathering, 3-87
  - rainfall, 5-73-B
  - rivers, 5-473-A
  - trade, 5-\*66, 73
- Egyptian architecture,** *see* Egypt, architecture
- Egyptian art,** *see* Egypt, ancient country, *sub-heads* art and crafts
- Egyptian language,** *see* Egypt, ancient country, language and writing
- Egyptian vulture,** bird, 4-161
- Egyptians,** early name for gypsies, 5-389
- "Egyptians,"** nickname for people of Illinois, 8-106-A
- Ehrlich, Paul,** physician and chemist, 10-550
- Eider down,** feathers, 6-485
- Eidsvold,** Norway, national assembly, 6-\*389, 390
- Eiffel Tower,** Paris
  - first flight around, 10-314
  - height, 11-522
- Eighteen-pounders,** bullets, 10-361
- Eighteenth Amendment to U. S. Constitution,** 7-336
- Eighteenth century,** summary of, 11-279
- Eightfold Path of Buddhism,** 5-370
- Einstein, Albert, life and work,** 13-†408-9
  - mathematical genius, 13-408; 10-425
  - portrait, 13-\*408
  - studies on light, 1-420, 427; 13-409
  - suffers under Nazi pogrom, 6-241
  - theories, 13-409, 13-304; 1-558-B
  - sun's heat, 1-386
- Eire,** *see* Ireland
- Eisenhower, David Jacob,** 12-555-F
- Eisenhower, Dwight David,** American general, life, 12-†555-F-555-G
  - in World War II, 6-539, †540-550; 12-555-G
  - portraits, 12-\*555-E, \*555-G
- Eisenhower, Mrs. David Jacob,** 12-555-F
- Eisteddfod,** Welsh Congress of Bards, 6-\*136, 139, \*140, 141

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



- El Cabrillo National Monument**, 8-42-B  
**El Capitan**, *see* Capitan  
**El Capulin**, *see* Capulin Mountain  
**El Dorado**, fabled city, 5-500; 13-480  
**El Dorado**, Ark., oil, 8-29  
**El Dorado State**, 8-42-B  
**El Greco**, *see* Greco, El  
**El Morro National Monument**, New Mexico, 8-262-A; 7-\*418, 419  
**El Paso**, Texas, rainfall, 8-386  
**El Salvador**, *see* Salvador  
**Elaine**, in Arthurian romances, 14-\*399  
**Elamite writing** on Behistun Rock, 5-104  
**Elamites**, ancient people, 5-100  
**Eland**, antelope, 4-416, \*419, \*421  
**Elasticity**, of rubber, 9-261  
**Elba**, island, Mediterranean Sea, 6-474  
   map, 6-588  
   Napoleon banished to, 6-88; 12-432  
**Elbe River**, Germany, rises in Czechoslovakia  
   as lake; flows to North Sea, 10-257  
   length, 10-253  
   map, 6-582, 599  
   source, 6-290-A  
**Elbert, Mount**, Colo., elevation, 8-52-A  
**Elbow**, bandaging, 2-\*401  
**Elbow joint**, anatomy, 2-\*320  
**Elbrus, Mount**, mountain peak of Caucasus, 1-25, \*26  
   map, 5-582  
**Elburz or Elbruz Mountains**, Persia  
   highest peak, 5-106  
   map, 5-580  
   rainfall, 5-106  
**Elder**, Old Norse literature, *see* Eddas  
**Elder Brewster's chair**, 12-\*198  
**Eldorado mine**, Canada, uranium, 7-\*29-X  
**Eld's deer**, 4-\*409  
**Eleanor crosses** in England, 6-24  
**Eleanor of Castile**, queen of England, 6-\*24  
**Eleanor of Aquitaine**, 14-586  
**Elections**  
   Greece and Rome, 7-348  
   United States, 7-363 fol.  
     Davies Direct Primary Law, 8-156  
     primary election law, Wisconsin, 8-445  
     *for regulations of various states see subhead*  
     political facts listed under each state  
**Elector, the Great**, *see* Frederick William, the Great Elector  
**Electoral College**, U. S., established, 7-181  
**Electors of Holy Roman Empire**, 6-208, 217  
**Electors, presidential**, 7-366  
**Electra**, maiden, in Greek tragedy, 13-\*37, 38; 14-452  
**"Electra"**  
   drama by Euripides, 13-38  
   drama by Sophocles, 13-36  
   opera by Richard Strauss, 12-316  
**Electric catfish**, 3-242  
**Electric cell**, principle and construction, main article, 1-†493-500  
**Electric cell—continued**  
   chemical action in, 1-\*497  
   connection, 1-†517  
   how to make, 1-498  
   in flashlight, 1-\*527  
**Electric charges**, positive and negative, 1-495  
**Electric circuit**, *see* Circuit, electric  
**Electric clocks**, 10-468  
**Electric current**, main article, 1-†513-20  
   conductors, 1-247, 514, 9-389  
   direct and alternating, 1-507, 516  
   galvanometer measures, 13-391  
   how produced, 1-500  
   induced in coil of telephone receiver, 1-520  
   induced in dynamo, 1-†502  
   induced in wire with magnet; Faraday's experiment, 1-†504  
   measurement, 1-†509  
   resistance to flow, 1-515  
   source of heat, 1-383  
   speed of electrons through conductor, 1-516  
   transformers, 1-†510, 511  
   transmission, 1-†510  
   variable, 1-516  
**Electric eye**, *see* Photo-electric cell  
**Electric generator**, *see* Dynamos  
**Electric heating**, 10-584  
**Electric heating devices**, 1-523  
**Electric iron**, 1-523  
**Electric lamps**, construction, 1-†525-27  
   cause of burning out, 1-525  
   early experiments with, 10-390  
   Edison's invention, 10-†392, \*393  
   energy lost in heat, 1-351  
   filament, 1-\*373  
     tungsten filaments, 1-\*535, 536  
   how connected, 1-†517  
   incandescent, 10-†392, \*393  
   lighthouse, 10-226, 228  
   nitrogen-filled, 1-527  
   stimulate plant growth, 1-\*345, 347  
   *see also* Electricity  
**Electric-light bug**, 3-†402  
**Electric lighting**, 10-390, †392, †393  
   arc light, 10-392  
   mercury vapor lamp, 10-392  
   neon light, 10-392  
   *see also* Electric lamps  
**Electric motors**, 1-†527-28  
**Electric organ**, 1-\*440  
**Electric power**  
   dynamos or generators, 1-†502, 506-8  
   Faraday's experiments; importance, 1-504  
   how obtained, 10-548  
   measurement, 1-508-09  
   Russia's projects, 10-261-62  
   source, 10-548  
   transformers, 1-†510, 511  
   TVA project, 8-372  
   *see also* Dynamos; Power house  
**Electric ray**, fish, 3-198, 201  
**Electric refrigeration**, 10-†518-19; 1-410

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Electric shock**, *see* Shock, electric

**Electric signs**, light used, 10-392

**Electric trams**, in mines, 9-\*416

**Electrical appliances**, 1-†522, 523

**Electrical Code of Rules and Regulations**, 1-524

**Electrical industries**, census of, 7-379

**Electrical resistance**, 1-†515

tungsten, 9-422

**Electrical thermometers**, 1-207

**Electrical thermostat**, 1-\*480

**Electricity**, main article, 1-†485-528 (*see also* Contents Volume 1 for chapter headings and main subjects listed below)

atoms and, 1-2

aurora borealis caused by, 1-†526

automobile ignition, 10-†285

cables, submarine, 10-†101-6

cannon loaded by, 10-368-A

chemistry's contributions, 10-548

coal converted into, 9-444

conductors and insulators, 1-247, 514; 9-389; 10-106, 552; copper, 9-419

**current**, 1-†513-20; *see also* Electric current muscle fibre generates, 2-331

early experiments, 1-†494; 12-465

economic importance, 7-499

Edison's inventions, 13-442, 443

**electric cell**, 1-†493-500

electromagnet, Faraday's discovery, 1-\*503, 504, 506; 13-387

electron theory, 1-499, 561

**electronics**, 1-561-64

fluid theory, 1-495

form of energy, 1-341, \*345, 347, 349

generated by electric ray fish, 3-198

**generation and measurement**, 1-†502-11, †509, 515, 113

static electricity machine, 1-†494, 495

induction, 1-†504, 506

lightning and thunder caused by, 1-246

**magnets**, 1-†485-91

matter and, 1-284, 500

measurement and units

ammeter, instrument, 1-\*509

ampere, unit, 1-508

galvanometer, instrument, 13-391

ohm, unit, 1-515

volt, unit, 1-509

voltmeter, instrument, 1-\*509

watt, 1-509

negative and positive, 1-495, 542

property of amber, 9-314

resistance to flow, 1-†515

safety measures and devices, 2-430; 7-395, 397; 1-524

series and parallel connections, 1-†517

sound reproduction by, 10-110

sparks caused by, 1-513

transformers, 1-†510, 511

transmission, 1-†510, †516

use on farms, 7-453

aid to efficiency, 1-513

**Electricity**—*continued*

detection of icebergs by, 1-64

dynamios, 1-†502, 506-8

kitchen, 1-†522

milking machines, 9-\*336

motion pictures, 10-†503-6

**production of heat, light, and power**, 1-†522-28, 383, 386; 10-384

radar, 1-†566-68

radio, 10-†115-21-R

telegraph, 10-†94-99

telephone, 1-†518-20; 10-110

television, 10-†123-26

traffic control by, 10-156

voltaic cell, 1-496

*see also* headings beginning with Electric and Electro

**Electrochemistry**, *see* Chemistry

**Electrodes**, of electric cell, 1-496

**Electrolysis**, process, 1-500

bronze restored by, 12-24

salt, 1-557

water, 1-†363-64

*see also* Electroplating; Electrotyping

**Electrolyte**, of electric cell, 1-496

**Electromagnetic spectrum**, 10-494

**Electromagnets**, principle and use, 1-†486 fol.

dynamo, 1-†502, 506, 507

Faraday's experiments, 1-\*503, 504, 506

simple, how to make, 1-\*486, 487

sound reproduction by, 10-110

steel manufacture, 9-\*406

telephone, 1-\*518, 520

**Electron microscope**, 10-489

**Electronics**, main article, 1-†561-64

applied in electric organ, 1-\*449; in camera, 10-\*446

**Electrons**, 1-499; †541, 542

atoms and, 13-3

**flow (electric current)**, 1-†513-20

negative electric particle, 1-284

seen under ultra-microscope, 10-490

size, 1-280

**Electroplating**, 9-420

silver, 9-389; 12-92

**Electrostatic machine**, 1-†494, 495

**Electrotyping**, 10-†57

**Electrum**, used in ancient coins, 7-502

**"Elegy Written in a Country Churchyard,"** by Thomas Gray, 11-476; 13-†202

**Elements**, in ancient theory of matter, 1-531

**Elements, chemical**, main article, 1-†530-38; list, 1-\*551

active, 1-545, 547

atomic numbers, 1-551

atomic weights, 1-551, 554

chart, 1-\*551

combination of, 1-543, †544, 545; *see also* Compounds

defined, 1-282, 357, 534

disintegration, 9-425

grouping, 1-548

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Elements, chemical—continued**

- inert, 1-545, 547
- liquid, 1-538
- listed by Lavoisier, 13-381
- number, 1-535
- \*radioactive, 9-425
- separated by Davy, 13-385
- spectra of, 1-441
- symbols, 1-551
- "Elena,"** racing yacht, 10-\*173
- Elephant,** mammal, *see* Elephants
- Elephant, sea** (seal), 4-335
- Elephant beetle,** 3-340
- Elephant Butte Dam,** 8-\*382, 260; 10-531
- Elephant mound,** 8-439
- Elephant shrew,** 4-\*278, 282
- Elephant tortoise,** 3-468, \*479
- Elephantine,** Egypt, island in Nile, 5-56
- Elephants,** main article, 4-†337-44
  - art, 11-\*3, 4
  - development from prehistoric form, 3-\*54
  - difference between African and Indian, 4-339 *fol.*
  - domesticated, 4-339, \*340, 341
  - drawing and mounting, 14-\*66
  - earth supported by, 1-102
  - examined by six blind men, 2-†295
  - largest land animal, 3-70
  - pigmy, 4-340, \*342
  - prehistoric
    - fossils found in Siberia, 3-\*4, 5
    - in Tertiary period, 3-52, \*54, 56
    - woolly mammoths, 3-\*55, 4-344; 5-\*26
  - Rafflesia seeds disseminated by, 2-250
  - "rogue," or mad elephants, 4-342
  - symbol on Siamese flag, 5-428
  - trunk, 4-338
  - tusk, 5-\*460
  - uses
    - circus, 12-†575, \*576, \*578, †579
    - India, 5-†369
    - transportation, 4-341; 10-\*133
    - warfare, 4-339; 12-353
    - white, 5-430-A
    - zoo, 4-\*479, \*480
- Elephant's-ear, plant,** 2-51
- Eleusis, Attica,** ceremonies in honor of Dionysus, 13-33
- Elevated railroads,** 7-399; 10-\*198
- Elevator, passenger,** construction, 10-†337
  - essential to skyscraper, 11-522
  - safety precautions, 2-430
- Elevator, airplane,** 10-\*328-K
- Elevator, wheat,** 9-\*236
- Elevator bridges,** 10-214
- Elf owl,** 4-\*166
- Elfsborg, N. J.,** established by Swedes, 8-250
- Elgar, Sir Edward,** 12-257
- Elgin, James Bruce, Earl of,** 7-18
- Elgin, Thomas Bruce, Earl of,** Parthenon sculptures brought to London by, 11-423; 5-16, 18
- Elgin Marbles,** 11-\*422, 423; 5-\*16, 18

- "Elia, Essays of,"** by Charles Lamb, 13-224
- Eligius, Saint,** patron of metal workers, 12-86
- Elijah, prophet,** 5-125
  - denouncing Ahab, 5-\*126
  - fed by ravens, 5-\*124
- "Elijah,"** oratorio by Mendelssohn, 12-245, 288
- Eliot, George (Mary Ann Evans Cross),** life and works, main article, 13-†260-61
  - opinion of Ruskin, 13-237
  - portrait, 13-\*261
- Eliot, T. S.,** poet, 13-353
- Elis,** district of Greece, on map, 5-\*150
- Elisha, prophet,** 5-125
- Elizabeth, Saint,** of Hungary, 6-\*279
- Elizabeth, queen of England,** life, main article, 12-†394-97
  - Bacon's flattery, 13-151
  - Boethius translated into English by, 13-58
  - courtships, 6-54, \*57; 12-395
  - diplomacy, 12-395-96
  - Drake honored by, 12-403
  - Essex, 6-54, \*57; 12-396
  - fashion of the time, 9-20, 95
  - foreign policy, 6-52, 55
  - horses, use of, 10-151
  - Ireland, rule in, 6-152
  - Mary Queen of Scots and, 6-†55; 12-397, 398, 399
  - ministers, 6-54
  - pearls, 3-162
  - portraits, 6-\*51; 12-\*395
  - postal service, 10-86
  - Raleigh a favorite, 13-479, 480
  - reforms, 6-53
  - reign, 6-†50-57
  - religion, 6-48, 52
  - Shakespeare acts before, 13-156
  - Spanish Armada, 6-56
  - Spenser's service to, 13-149, 150
  - Virginia named after, 6-57
  - virginal played by, 12-222
- Elizabeth, queen of Edward IV,** 6-\*38
- Elizabeth, queen of George VI,** at session of Canadian parliament, 7-\*29-C
- Elizabeth, heir apparent to British throne,** 6-108
- Elizabeth of York,** marries Henry Tudor, 6-39, 42
- Elizabeth Petrovna,** empress of Russia, 6-430
- "Elizabeth the Queen,"** by Maxwell Anderson, 13-355
- Elizabeth, N. J.,** Princeton established, 7-29-V
  - factory, 8-248
- Elizabethan Age,** main article, 12-394-97; 6-51
- Elizabethan architecture,** 11-\*480, †491
- Elizabethan furniture,** 12-188
- Elizabethan theater,** 12-328, 329-30
- Elizabethtown, N. J.,** founding of, 8-251
- Elizabethtown, Pennsylvania,** 12-555-F
- Elk,** *see* Moose; Wapiti deer
- Elk, Olympic,** 8-428-A
- Elk Island National Park,** Canada, 7-29-V
- Elk Refuge,** Wyoming, 8-454-A
- Elkhorn River, Neb.,** 8-228

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Ell**, measure, 10-374
- Ellesmere Island**, Arctic Ocean, maps, 13-502-A; 5-572
- Elliot pheasant**, bird, 4-\*189
- Ellipses**, motion in paths of, 1-287, 289, 162
- Ellis Island**, New York, inspection of immigrants, 7-\*338
- Ellsworth, Lincoln**, Arctic flights, 13-501, 502
- Ellsworth, Oliver**, American jurist and statesman, 12-\*496
- Ellsworth, Mississippi**, sends first telegraph message, 10-98
- Elm**, tree, 2-\*272  
leaves and flowers, 2-\*160  
wood; uses, 9-258
- "Elsie Venner,"** by Oliver Wendell Holmes, 13-309
- Elsinore**, Denmark, castle, 6-413
- Elvers**, young eels, 3-251
- "Elves and the Cobbler, The,"** fairy tale, text, 14-†201-2
- Ely**, Nevada, Lehman Caves, 1-\*85
- Elysian Fields**, mythology, 14-424
- Emancipation Proclamation**, 7-263
- Emanuel I**, the Fortunate, king of Portugal, 6-341  
expedition to India, 13-460
- Embalming**, by Egyptians, 5-54
- Embargo Act of 1807**, 7-208  
New Hampshire affected, 8-238
- "Embarkation for Cythera, The,"** painting by Watteau, 11-\*281, 283
- Embossing**, bronze, 12-16
- Embroidery**  
Chinese, 12-\*138, 140  
lessons in, 14-†74  
relation to lace, 12-164, \*171
- Embryo**, in plants, 2-104, 125, †126
- Emelye**, in "Canterbury Tales," 14-\*334, 335-36
- Emerald humming bird**, 4-\*178
- Emerald Isle**, name for Ireland, 6-151
- Emeralds**, precious stones, 9-433
- Emergency brake**, 10-291
- Emerson, Ralph Waldo**, life and works, main article, 13-†303-5  
Carlyle and, 13-236, 305  
cited, 13-7  
interest in Brook Farm, 7-244  
opinion of Plato's "Republic," 13-7; 7-526  
portraits, 13-\*304, \*308  
quoted, 7-163  
recognition of Whitman, 13-327  
Thoreau and, 13-311
- Emetics**, in first aid, 2-408
- Emigrant Aid Societies**, 7-248
- "Emile,"** by Jean Jacques Rousseau, 13-19
- "Emma,"** by Jane Austen, 13-208
- Emmanuel Philibert**, duke of Savoy, 6-303
- Emmenthaler cheese**, made in Emmenthal Valley, 9-348
- Emmet, Robert**, Irish patriot, 6-158
- Empedocles**, Greek philosopher, conception of matter, 1-281
- Emperor goose**, 4-120
- "Emperor Jones, The,"** drama by O'Neill, 13-354
- Emperor marmoset**, member of monkey family, 4-267
- Emperor moth**, 3-292
- Emperor penguin**, bird, 4-†219
- "Emperor Quartet, The,"** by Haydn, 12-274
- Emperors**  
government by, 7-347  
Holy Roman, *see under* Holy Roman empire  
Roman, 5-236; 7-350
- Empire furniture**, 12-\*189, 192
- Empire State** (New York), 8-264
- Empire State Building**, New York, 11-†522; 1-\*241; 7-\*532
- Empire State of the South**, name for Georgia, 8-83
- Empire Trade Conference**, 7-29-31
- Employer's Liability Acts**, industrial welfare laws, 7-439
- Empty**, game, 14-161
- Emu**, bird, 4-†236, †474  
eggs and hatching, 4-238
- Enamel**, oil used in, 10-548
- Enamel of teeth**, 2-\*313, 315
- Enamel painting**, 12-68
- Enamels and enameling**, main article, 12-†63 68  
ancient, 12-†63, †64  
basse-taille, 12-66  
Byzantine, 12-†64-66  
champleve, 2-63, †65-66  
church furniture, 12-66  
cloisonne work, 12-63 fol  
medieval, 12-†65, 66  
mosaics' resemblance to, 12-110  
on stained glass, 12-†74-77  
substances used in making enamel, 12-63  
tung oil used for, 9-312
- Enchanted Mesa**, New Mexico, Indian village, 7-†4
- Encke's comet**, 1-163
- Enclosures** in Scottish Highlands, 6-134
- Encyclopedia** of Diderot and D'Alembert, 13-120
- Encyclopedists, the**, of France, 13-120
- "Endeavor,"** Captain Cook's ship, 13-489
- Endecott or Endicott, John**, colonial governor, settlement of Salem, 8-168
- Endicott Range**, Alaska, 8-16
- Endocardium**, membrane of heart, 2-370
- Endodermis** of plants, 2-\*36
- Endoplasm**, in amoeba, 2-\*21
- Endosperm** of plants, 2-128  
corn seed, 2-\*126
- "Endurance,"** Shackleton's ship, 13-\*507
- Endurance foot race**, 14-473
- "Endymion,"** by John Keats, 13-231
- Endymion and Diana**, Greek legend, 14-\*455, 456
- "Enemy of the People, An,"** by Ibsen, 13-88

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Energy, sources and conservation, main article,**

- 1-†343-52
- defined, 1-339
- air molecules, 1-406
- atomic, 1-†558-A-11
- electrical, 1-341
- forms and changes of, 1-349, 351
- heat energy, 1-†382
- kinds, 1-340-41
- law of conservation, 1-349, 351
- light, 1-414, 415, 430
- mechanical, 1-340, †382
- potential and kinetic, 1-338, 339
- sun the source of, 1-341, †313-52

**Energy, human**

- derived from food, 2-334, 360, 366
- released by breathing, 2-51

**Enfant, Pierre Charles L', see L'Enfant, Pierre Charles****Engabrae Glacier, Norway, 6-407 A****Engagement rings, see Betrothal rings****Engagers, Scottish, 6-127\*****Engelbrekt Engelbrektsson, "Liberator" of Sweden, 6-396****Engels, Frederick, co-author with Marx of "Capital," 7-549, 550****Engineering (see also entries under main subjects listed below)**

- bridges, 10-†209-14
- canals, 10-†269-74
- highways, 10-†150-56
- irrigation, 10-†528-33
- lighthouses, 10-†226-29
- tunnels, 10-†202-07
- waterworks, 10-†535-42

**Engineers, army, 7-478-†79****Engineers' School of Application, 12-555-J****Engines, internal combustion, 10-278, †291**

- airplane, 10-†322
- automobile, and its mechanism, 10-†282-91
- Diesel, 10-†276
- responsible for modern vehicles, 7-†500

**see also Locomotives, Motors; Steam engine****England, division of Great Britain, main article,**

- 6-†1-108; general data, 6-108 B (see also Contents Volume 6 for chapter headings)
- see also index World War II, 6-493

**Age of Prose and Reason, 6-75****animal life**

- bats, 4-†275
- birds, 4-†170-75
  - grebe, 4-111
  - pheasant, 4-187
  - swallow, 4-36
- deer, 4-†412
- foxes, 4-303
- rats and mice, 4-383 fol.

**architecture**

- Elizabethan, 11-†480, †491
- Gothic, 11-†472-78
- Norman, 11-456
- Renaissance, 11-†492, 493

**England—continued**

- area, 6-108-B
- armor, 10-†353
- art, see British art; British crafts
- Bank of England, Threadneedle Street, London, 6-†77
- bear-baiting, 6-425
- buccaneers rooted out by, 10-170
- chalk cliffs, 3-14, 79
- chivalry, 13-146
- cities, 10-253-54
- climate, 1-225
- coast line lifting and sinking, 1-69, 70
- colonization
  - India difficult, 5-385
  - see also English in America
- convicts, disposal of, 5-547
- costume, see England, people
- counties, 6-108-B
- Cromwell's army, 12-†407-9
- cross of St. George, 14-facing \*572, 573
- drama and theater, 12-326-27, 329-30, 331, 332, 333, 334
- Established Church, 7-124; see also Church of England
- explorations
  - Cabot, 13-472
  - Captain Cook, 13-489
  - Drake claims California land, 8-34
  - during reign of Elizabeth, 6-57
  - lumber an attraction, 8-153
  - Maine coast, 8-150, 151
- famous ports, 10-253
- first marines, 7-492
- flag, color plate, 14-facing \*572
- foreign relations
  - American colonies, 7-126, †157-63
  - Arabia, 5-401
  - China, 5-331, 332
  - Egypt, 5-73-B
  - Germany, 6-234
  - Greece, 5-182
  - Italy's threat to Mediterranean, 6-315
  - Portugal, 6-340
  - United States
    - during eighteenth century, 7-196, 197
    - during early nineteenth century, 7-208, 210
    - during Civil War, 7-258
    - Oregon question, 7-234, 236
    - disputes over Alaskan affairs, 8-14
    - South American disputes, 5-517; 7-289, 290
- Franklin's mission to, 12-466
- French influences, 6-20
- fuel, wood supply exhausted, 8-407
- game laws, 4-518
- gold standard abandoned, 7-340
- government
  - church's power; early, 6-33
  - courts; Star Chamber, 6-42
  - divine right of kings, 6-60

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**England, government—continued**

Domesday Book, 6-20

feudalism, 6-20

jury trials introduced, 6-†21

Magna Charta, 6-24; *see also* Magna Charta  
nineteenth century reforms, 6-94, 95, 100,  
101

Norman influence, 6-14

parliament, *see* Parliament, British

Petition of Right, 6-62

Poor Laws, 6-95

Workhouse Test, 7-435

taxation; poll tax, 6-32

twentieth century changes, 6-102 fol.  
type, 6-333

voting, 6-93, 100, 103

*see also* Great Britain, government

haven for Jews, 5-137

**history, 6-†1-108****early invasions, 6-†1-16**

in Roman times, 6-†2 fol., \*15

Anglo-Saxon Conquest, 6-\*5, 8

Danish invasions, 6-\*10, †11 fol., 409,  
410; 10-10

Germanic invasions, 6-6, 12, 14; 10-10

Norman Conquest, 6-16, 19; 10-11

**after Norman conquest, 6-†18-39**

Plantagenets, 6-21

Magna Charta, 6-\*18, 24; 7-\*352, 353

Hundred Years' War, 6-†26-28, 35, 170,  
174-76

house of Lancaster, 6-34

Wars of the Roses, 6-37, 39

**under the Tudors, 6-†41-57**relations with Scotland; wars, 6-112, 113;  
12-381-84

Wales conquered, 6-139

rule in Ireland, 6-†151-62

Reformation, 6-45, \*47, 48

Henry VIII becomes head of church,  
13-148Mary I's efforts to restore Catholicism,  
12-395**Elizabethan Age, 6-†50-57**

war with Spain, 6-56

efforts to wrest sea power from Spain,  
10-169

Spanish Armada defeated, 12-397, 405

rule of Canada, 7-11

American Revolution, 7-11, 12, †163-70

war with Holland, 5-478

**under the Stuarts, 6-†59-72**

union with Scotland, 6-129

colonists in America, 7-141-43

Civil Wars, 12-407-9

Commonwealth, 6-68; 12-409

Restoration, 6-70, 72

Dutch settlements in New York ac-  
quired, 7-130**under the Hanoverians, 6-72, †74-81**greatness of empire; loss of American  
colonies, 6-81**England, history, under Hanoverians—continued**

Australia annexed, 5-\*543, 546

Napoleonic Wars, *see* Napoleonic Wars  
victory over Denmark, 6-416Seven Years' War (French and Indian  
War), 6-\*79, 80; 5-381; 7-\*141, 143  
war in India, 5-381

attitude toward French Revolution, 6-86

union of Ireland and England, 6-158

War of 1812, 6-90, 91; 7-15

winning of Canada, 7-7, 143

**Industrial Revolution, 6-†83-95****Victorian Age to present time, 6-†97-108**

Crimean War, 6-98, 436; 5-414

in India, 6-99; 5-377-87

empire at its height, 6-100

Disraeli's premiership, 12-440-41

Gladstone's premiership, 12-442-43

in South Africa, 5-480, †484-91

Boer Wars, 6-101; 5-486, 487; 7-28

Triple Entente, 6-438

rule in Egypt, 5-72

mandate over Palestine, 5-141

World War I, 6-104, 236, 237

Anglo-Irish War, 6-161, 162

accession of George VI, 6-\*108

war against Germany (1939), 6-108

World War II, 6-†494-504

*see also* English sovereigns, as Elizabeth

holiday customs, 12-326

Christmas customs, 14-590

May Day celebration, 12-326

industries, *see below* products and industries

influence of culture on Scotland, 6-112

Irish influence on art and learning, 11-84

"John Bull," 13-184

labor, growth of power

absence of power under John, 6-24

demands higher wages, 6-28

discontent and revolt, 6-32-34

favorable regulations under Elizabeth, 6-  
53, 54

Industrial Revolution, 6-83-86, 93-95

Labor party formed, 6-101-2, 108

money invested in South Sea Bubble, 6-76

language, *see* English language

libraries, famous, 10-556, 560

literature, *see* English literature

location, 6-108-B

mail service, first, 10-†86, 87

Manchester Ship Canal, 10-274

maps, 6-572

British Empire, 6-\*107

distribution of people after Anglo-Saxon  
Conquest, 6-\*5

on map of Europe, 6-570

music and musicians, 12-216, †319

madrigals, 12-220

opera, 12-227, 256

name, origin of, 6-111

New Learning and its leaders, 6-43

newspapers, earliest, 10-74

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**England—continued**

Orders in Council, 7-208, 210  
 Parliament, *see* Parliament, British  
 patron saint, 13-524  
 people, 6-108-B  
   character, 5-264  
   fashions in dress, 9-18, †20, 22, 58  
   racial origin, 5-†44, 268, 269, 271; 6-16  
   use of tea by, 9-135  
   *see also* Britons; Celts; Normans  
 period of romanticism and poetry, 6-86  
 physical features, 6-108-B  
 products and industries, 10-253-54  
   button manufacture, 9-51  
   canning, 9-228  
   carpet manufacture, 12-159  
   cheese making, 9-346, 347, 348  
   chinaware, 12-61  
   coal, *see* Great Britain, coal  
   cotton manufacturing, 9-32  
     affected by China's difficulties, 7-578  
   dye, 9-307  
   fisheries, 9-366  
   glassmaking, 12-34-36  
   linen manufacture, 9-48  
   minerals, 10-254  
   salt, 9-412  
   sheep raising, 9-\*325  
   shipbuilding, 8-153  
   spinning and weaving, 10-340  
     textile industry, 9-29  
   tin, 6-4, 9-420  
   wool production, 6-53, 54; 9-74  
   woolen manufacture, 9-75  
 religion, *see* Church of England  
 Renaissance and its literature, 6-57  
 rival of Holland for control of sea, 10-170  
 rivers, 10-253-54  
 roads, 10-151  
 sailors, cruelty to, 7-492  
 search of American ships, 7-208  
 shelter  
   Buckingham palace, 6-\*93  
   cottage, 9-\*375  
   Southey's home, 13-\*219  
   Tower of London, 6-\*41  
   typical villages, 6-\*83; 13-\*208  
   Wordsworth's home, 13-\*216  
 shifts in ownership of, 6-83  
 slave trade, 5-448, 470  
 social legislation, 6-101  
 socialist party, 7-551  
 sports  
   boat racing, 14-†531, 532, 533  
   cricket, 2-\*360  
   golf, 14-494  
   polo, 14-525  
   yachting, 14-528  
 Stone Age implements, 9-435  
 supremacy on seas, 10-171  
 sympathy with South American patriots, 5-506

**England—continued**

trade, 7-575  
   a trading power, 10-171  
   blockade during Napoleonic Wars aids  
     British trade, 6-90  
   cargoes of tramp steamers, 10-232  
   centers, 10-253-54  
   China, 5-331  
   cotton import, 5-\*462; 10-185  
   Eastern sections of empire, 10-236  
   effect of Machine Age, 6-85  
   free trade, appeal for, 6-95  
   India, 5-378, 386  
     British goods boycotted, 5-387  
   Japan, 5-354, 361  
     exclusion, 5-357  
   Malays, 5-426  
   merchant marine, number, 10-232  
   Orkney Islands, 6-487  
   Phoenicians; tin, 6-4  
   quarrels with American colonies, 6-81; 7-157-59, 160, 162  
   slave, 6-95  
   spice, 9-206  
   tea, 7-161; 10-172  
   under Elizabeth, 6-54  
   wool trade with Flanders, 6-26, 39  
 transportation  
   air travel, 10-320, \*321, 322  
   automobile, 10-277 fol.  
   locomotive, 10-148, †177 fol., †186-88  
   omnibus, stagecoach, carriage, 10-144, \*145, \*147  
   sedan chairs, 10-\*132  
   steam vehicles opposed, 10-186, 278  
   steamboat, 10-220, 222 fol.  
 village, 6-\*83  
 weights and measures, 10-371 fol.  
*see also* Britain; British Commonwealth of Nation; Great Britain  
**England, Church of**, *see* Church of England  
**"England, History of,"** by David Hume, 13-16  
**Engle, H. E.**, composer of "West Virginia Hills," 8-436-B  
**English**, billiard term, 14-481  
**English architecture**, *see* England, architecture  
**English art**, *see* British art  
**"English Barbs and Scotch Reviewers,"** by Byron, 13-226  
**English Channel**, Europe  
   Bleriot's flight across, 10-318, 324  
   crossed in balloon, 10-314  
   maps, 6-573, 570, 578  
   once a dry valley, 1-70  
**English crafts**, *see* British crafts  
**English East India Company**, *see* East India Company, English  
**English horn**, musical instrument, 12-258-A  
   imitated by organ, 12-258-D  
**English in America**  
   Delaware, 8-65  
   Florida, 8-69

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**English in America—continued**

- French territory gained by, 8-111, 441
- Georgia, 8-78
- Idaho claimed, 8-88
- Illinois, 8-97
- Jamestown, 8-406
- method of settling Canada, 7-2
- Michigan, 8-181
- Mississippi, 8-201
- New Amsterdam, 8-273 fol.
- New England settlements, 8-399
- North Dakota, 8-300
- Ohio territory, 8-305
- Oregon (1812), 8-326
- outlet for manufactures, 8-407
  - relations with American Indians, 7-141; 8-400
  - rivalry with French, 5-381
  - rivalry with Dutch, 8-273
  - Sir Walter Raleigh's settlements, 13-478 fol.
  - South Carolina, 8-350
  - see also* Pilgrims; Puritans, in New England
- English language**, main article, 10-†1 25
  - alphabet, 10-45
  - "American" differs from "British," 10-23
  - Basic English, 10-7
  - becomes official in England, 6-28
  - Caxton's influence, 10-21, 54
  - Chaucer's influence, 10-18
  - contributions of other tongues, 10-4, 12
    - Anglo-Saxon, 10-10
    - Danish, 10-10
    - French, 10-11, 17, 18
    - Latin, 10-11, 17
  - derivation and changes in meanings of words, 10-†9-15, †17-25
  - origin and development, 10-†1-7
  - pidgin English, 10-\*7
  - printing tends to standardize, 10-21
  - slang, 10-24, 510
  - spread of, 10-15
- English literature**
  - Americans interpret American life, 13-345
  - biographies**, 13-†140-274
    - Arnold, 13-†254-56
    - Austen, 13-†207-8
    - Bacon, Francis, 13-†150-52
    - Barrie, 13-267-68
    - Bede, 13-†140-41
    - Blake, 13-†211-13
    - Boswell, 13-†195-97
    - Brontës, 13-†247-48
    - Browning, Elizabeth, 13-253
    - Browning, Robert, 13-†251-52
    - Bunyan, 13-170-71
    - Burke, 13-201
    - Burns, 13-†209-10
    - Byron, 13-225-29
    - Carlyle, 13-†235-36
    - Carroll, Lewis, 13-†266-67
    - Chatterton, 13-204-5
    - Chaucer, 13-†141-44
    - Coleridge, 13-†217-18

**English literature, biographies—continued**

- Conrad, 13-273-74
  - Cowper, 13-213
  - Defoe, 13-†175-77
  - De Quincey, 13-†232-33
  - Dickens, 13-†242-45
  - Dryden, 13-†173-74
  - Eliot, George, 13-†260-61
  - Fielding, 13-†187-88
  - Gibbon, 13-†200
  - Goldsmith, 13-197-99
  - Gray, 13-†202-4
  - Hardy, 13-†264-65
  - Johnson, Samuel, 13-†192-95
  - Jonson, Ben, 13-†163-64
  - Keats, 13-†230-32
  - Kingsley, 13-†246-47
  - Kipling, 13-268 69
  - Lamb, Charles and Mary, 13-†223-24
  - Macaulay, 13-234-35
  - Malory, 13-†145-46
  - Marlowe, 13-†162-63
  - Masefield, 13-270
  - Meredith, 13-†261-63
  - Mill, 13-†238-39
  - Milton, 13-†166-70
  - More, 13-†147-48
  - Pepys, 13-172
  - Pope, 13-†183-85
  - Richardson, 13-†186-87
  - Rossetti, The, 13-†256-57
  - Ruskin, 13-†236-38
  - Scott, 13-†221-22
  - Shakespeare, 13-†153-61
  - Shaw, 13-271-72
  - Shelley, 13-†228-29
  - Sheridan, 13-†205-7
  - Smollett, 13-†190-91
  - Southey, 13-†219-20
  - Spenser, 13-†149-50
  - Steele and Addison, 13-†180-82
  - Sterne, 13-†189-90
  - Stevenson, 13-265
  - Swift, 13-†177-80
  - Swinburne, 13-†258-59
  - Tennyson, 13-†249-51
  - Thackeray, 13-†240-41
  - Walton, 13-†165-66
  - Wordsworth, 13-†214-16
- for further references see names of writers in index, as Blake; Lamb; Walton*
- drama, 12-326-28, 330, 331
  - Elizabethan writers, 6-57; 12-397
  - essay, first, 13-152
  - "father of English prose," 6-33
  - Irish writers, 6-161
  - Romanticism, 13-215, 218
  - stories, retold, 14-†310-404
    - Arthurian romances, 14-†377-404
    - Beowulf, 14-†318-22
    - "Canterbury Tales," by Chaucer, 14-†329-36
    - Culliver's Travels," by Swift, 14-†343-52

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text



**English literature, stories—continued**

- Robin Hood**, 14-†353-60  
 Victorian writers, 6-97  
**"English Mail Coach, The,"** by Thomas De Quincey, 13-233  
**"English Opium Eater, Confessions of an,"** by Thomas De Quincey, 13-233  
**English Pale** in Ireland, 6-149  
**English people**, *see* England, people  
**English setter**, dog, 4-†497, †499-500  
**English sheep dog**, 4-†497  
**English shepherd**, dog, 4-†493  
**English (house) sparrow**, bird, 4-24  
   cicadas destroyed by, 3-373  
   destruction to crops, 4-136  
   pictured with field sparrow, 4-†91  
**"English Traits,"** by Emerson, 13-305  
**English walnuts**, 9-201, 202  
   California's production, 8-35  
**"English wooing, the,"** raids into Scotland, 6-120  
**Engraving**, process explained, 11-206  
   Durer, 11-208, 212  
   Hogarth, 11-296  
   line-engraving, 11-206  
   on glass, 12-†38  
   on gold and silver, 12-80  
   photo-engraving, 10-†67-71  
   steel, 10-62  
   woodcuts, 10-65  
**Enid and Geraint**, story of, in Arthurian legend, 14-†383-86  
**Enlightened despotism**, in Austria under Maria Theresa, 6-264, 284  
**Enlightenment, Age of the**, 13-120  
**Enlisted Reserve Corps**, U. S., 7-474  
**Ennius, Quintus**, 13-4  
**Enns, river**, Austria, 6-265  
**"Enquiry Concerning the Human Understanding, An,"** by David Hume, 13-16  
**Ensenada**, Argentina, harbor, 5-518-11  
**Ensilage**, preserved fodder, 9-334, 335  
**Entablature**, architecture, 11-†418, †419, 420  
**Entangling alliances**, Washington's warning against, 7-196  
**Entasis**, architecture, 11-422  
**Entente, triple**, *see* Triple Entente  
**Entente Cordiale**, 6-104; *see also* Triple Entente  
**"Enterprise,"** ship, 9-207  
**"Enterprise,"** steam carriage, 10-†178  
**Entertainment**, *see* Contents Volume 14 and *also* Magic, Puzzles, Riddles, Sports and Games; Things to Do; Things to Make; Tricks  
**"Entombment of Christ,"** depicted in art painting by Dirk Bouts, 11-†199  
   sculpture at Solesmes monastery, France, 11-†93  
**Entomology**, *see* Insects  
**Entrecolles, Père d'**, 12-43  
**Enzymes**, function in digestive process, 2-355, 356  
   food made digestible by, 2-53  
   in blood, 2-345

- Enzymes**, plant, 2-53  
   derived from papaya, 9-196  
   in pineapple juice, 9-186  
   of insectivorous plants, 2-60  
   of saprophytes, 2-56  
**Eoanthropus**, fossil man, 3-57  
**Eocene period**, 3-51  
   ancestors of horse in, 3-†50  
   bird: *Diatryma*, 3-†43  
   forms of life in, table, 3-64  
   rock formation, 1-†40  
**Eohippus**, prehistoric horse, 4-505, †507  
**Eolian harp**, *see* Aeolian harp  
**Eoliths**, prehistoric tools, 3-57  
**Eos (Aurora)**, goddess, 14-†414; 1-†109  
   Cephalus and, 14-434  
   mother of winds, 14-433  
   Tithonus and, 14-442  
**Epaminondas**, Theban general, defeats Sparta, 5-176  
**Ephesus**, ancient city, Asia Minor  
   competition for temple of Artemis statue, 11-43  
   Temple of Diana (Ephesian Dome), 5-185, †186, 11-43, 52  
**Epic poetry**, defined, 13-27  
   "*Aeneid*," by Virgil, 5-229; 13-48  
   *Beowulf*, 14-†318-22  
   "*Divine Comedy*," by Dante, 13-61  
   "*Iliad*" and "*Odyssey*," by Homer, 13-27  
   "*Jerusalem Delivered*," by Tasso, 13-68  
   "*Mahabharata*" and "*Ramayana*," Hindu, 5-368, 369  
   muse of, 14-412  
   "*Nibelungenlied*," German, 6-210  
   story retold in part, 14-†310-17  
   "*Paradise Lost*," by Milton, 13-169  
**Epicureanism**, philosophy, 13-11  
**Epicurus**, Athenian philosopher, 13-3, 10  
**Epidermis**, anatomy, 2-†287-88, †290; 9-67  
**Epidermis, botany**  
   apple, 2-116  
   leaf, 2-†26, †48, †52  
   root, 2-†36  
   stem, 2-32, †33  
*Epipactis atrorubens*, flower, 8-176-B  
**Epiglottis**, anatomy, 2-308  
**Epigrams**, Pope's, 13-185  
**Epimetheus**, (Afterthought), mythology and Pandora, 14-423  
   animals created by, 14-421  
**Epiphytes** (air plants), 2-†150  
**Episcopal Church**, American form of Church of England, 6-48  
**Episcopi**, in early Christian church, 5-275  
**Epstein, Jacob**, sculpture by, 11-†391  
**"Equal Rights,"** motto appearing on Wyoming's seal, 8-454-A  
**Equal temperament**, music, introduced by Bach, 12-263  
**"Equality Before the Law,"** motto of Nebraska, 8-228-A  
**Equality State**, 8-454-A

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Equations, Algebra,** 10-434, 424
- Equator**  
 cause of heat at, 1-†208-9  
 ceremonies at crossing, 10-300  
 length of day, 1-†201-3  
 snow-capped mountain on, 5-443  
 sun directly over, 1-111  
 touched by South America, 5-493
- Equatorial Africa,** *see* French Equatorial Africa
- Equatorial telescope,** instrument, 1-185
- Equilateral triangle,** geometry, 10-†439
- Equinox,** explained, 1-†203
- Equinoxes, precession of the,** 1-180
- Equisetum** (horsetails), fern ally, 2-\*91, 92
- Era,** geologic, *see* Geology, era
- "Era of Good Feeling,"** U. S., history, 7-216; 12-456-D
- Erard Sebastien,** "double-action harp" invented by, 12-258-A
- Erasers,** rubber, 9-261
- Erasmus, Desiderius, life and work,** main article, 13-†82-83  
 attitude toward Luther, 13-83  
 Dürer and, 11-211  
 portraits  
   Holbein's, 13-\*83; 11-212  
   Massys', 11-202
- Erato,** muse, 14-412; 12-\*205
- Erbium,** element, symbol, atomic no. and wt., 1-\*551
- Ercilla y Zúñiga, Alonso de,** author of "La Araucana," 5-499
- Erebus, Mount,** Antarctica, 13-510  
 elevation, 1-25
- Erechtheum,** temple, Athens, 11-\*419, \*424, 425  
 egg and dart motif, 12-\*94
- Eretria,** ancient city of Greece, destroyed by Persians, 5-162
- Ergot,** drug, 9-219-A
- Eric Blood-Axe,** king of Norway, 6-380
- Eric Glipping,** king of Denmark, 6-411
- Eric of Pomerania,** Scandinavian king, 6-396, 411, 412
- Eric the Red,** Scandinavian navigator, 7-110  
 discovers Greenland, 6-483; 7-110; 13-495  
 saga about, 6-420
- Eric the Victorious,** first king of Sweden, 6-393
- Eric IX,** Saint, king of Sweden, patron saint of Sweden, 6-394
- Eric XI,** the Lipping and the Lame, king of Sweden, 6-394
- Eric XIV,** king of Sweden, 6-\*399
- Ericsson, Gustaf,** *see* Gustavus I, king of Sweden
- Ericsson, John, life and work,** main article, 13-†439-40  
 portrait, 13-\*440  
 screw propeller perfected by, 10-223
- Ericsson, Leif** (Leif the Lucky), 7-†110  
 explorations, 7-1, †110  
 saga written about, 6-420  
 ship blown off course, 10-166
- Eridanus,** constellation, *see* River
- Erie, Pa.**  
 importance to Pennsylvania's manufactures, 8-338
- Erie, Lake, No. Amer.**  
 area, 8-186-A  
 climate affected by, 8-310  
 elevation, 8-186-A  
 La Salle reaches, 8-305  
 map, 7-595  
 plain once bed of, 8-308  
 Welland canal connects Lake Ontario, 10-274
- Erie, Lake, Battle of,** 12-†499-500; 7-†483
- Erie Canal,** New York, 8-279; 10-274, \*264  
 importance to Ohio, 8-308  
 length, 8-283
- Erie, Indians, in Ohio,** 8-305
- Erigena, Joannes Scotus,** Irish scholar, 6-146
- Erin,** name for Ireland, 6-151
- Erinyes (Furies), in Tartarus,** 14-455
- Eris (Discordia),** attendant on Mars, 1-149
- Eritrea,** colony, Africa, description, 5-457  
 Italian colonies, 6-309  
 map, 5-579
- "Erl King, The,"** song by Schubert, 12-285
- Ermak-Timofeevich (Yermak),** Cossack chief, gave Siberia to Ivan the Terrible, 6-428
- Ermine, animal,** 4-\*355, 356
- Ermine moth,** 3-288
- "Ernani,"** opera by Verdi, 12-300
- Eroica Symphony,** by Beethoven, use of horns in, 12-258-B
- Eros,** god, *see* Cupid
- Erosion,** 7-468  
 beautiful scenery caused by, 7-409, \*418, 419  
 Georgia, 8-83  
 Virginia, 8-417
- Eruptions, volcanic,** *see* Volcanoes
- Esbjerg,** Denmark, 6-\*413
- Escalante, Silvestre Vélez de,** Spanish missionary-explorer, 8-392
- Escalator,** construction and operation, 1-†337
- Escambia River,** U. S., 8-76
- Escarments,** in physiography, 8-266
- Eschenbach, Wolfram von,** *see* Wolfram von Eschenbach
- Eschscholtzia,** flower, 8-42-B
- Escorial,** palace, Spain, 6-\*332
- Eskimo dogs (huskies),** 10-130, \*133  
 carry anti-toxin to Nome, 10-130  
 illustrations, 4-\*496, \*501; 10-\*133  
   Amundsen's team, 13-\*508  
   asleep in snow, 13-\*511  
   Nansen's team, 13-\*499  
   Peary's teams, 13-\*493  
 services to man: strength, 4-492, 498
- Eskimos, people,** main article, 7-†35-39, 33-I; 8-\*15; 13-\*497  
 allied to Indian race, 7-35, 98  
 boats  
   canoes, 6-†484  
   kayaks, 10-138, †139  
 carving, 7-†39; 8-\*14; 12-95

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Eskimos, people** *continued*

- costume, 1-<sup>\*</sup>194, 9-<sup>\*</sup>21
  - muc-luc (moccasin), 9-<sup>\*</sup>54
  - shoes, 9-57
- descent from Grimaldi men, 5-28
- fishing, 1-<sup>\*</sup>199; 9-<sup>\*</sup>362
- food, 8-15; 2-80
- Greenland, 6-†482-84
- headdress, 9-<sup>\*</sup>88
- language, 7-36
- medicine men, 7-36
- mode of living, 1-<sup>\*</sup>194, 195, <sup>\*</sup>196
- pottery not used, 12-47
- racial origin, 5-28; 7-35; 8-10
- religion, 7-36
- shelter, 1-<sup>\*</sup>196; 7-36, <sup>\*</sup>38; 13-497
  - igloos, 9-<sup>\*</sup>379; 11-<sup>\*</sup>398
  - interior, 7-<sup>\*</sup>38
- system of counting, 10-421
- taboos, 7-36
- walrus: source of food and clothing, 4-333
- weapons, 7-†39
- where found, 7-35
- Esmeraldas River**, Ecuador, 5-518-A, 518-F
- Espagnola**, Haiti, first colony founded by Columbus, 7-57
- Esparto grass**, 9-290
  - rope from, 9-<sup>\*</sup>291
- Espejo, Antonio de**, Spanish traveller, in New Mexico, 8-262-A
- Esperanto**, language, 10-7
- Espiritu Santo**, island, Pacific Ocean, discovery, 5-552
- Esquimaux**, *see* Eskimos
- Essay**, form of literature, invented by Montaigne, 13-107
- "**Essay of Dramatic Poesy**," by John Dryden, 13-174
- "**Essay on Criticism, The**," by Alexander Pope, 13-185
- "**Essay on Liberty**," by J. S. Mill, 13-239
- "**Essay on Man, The**," by Alexander Pope, 13-185
- "**Essay on Projects**," by Daniel Defoe, 13-176
- "**Essays**," by
  - Bacon, 13-152
  - Burroughs, 13-426
  - Emerson, 13-303
  - Hume, 13-16
  - Macaulay, 13-234
  - Montaigne, 13-106
- "**Essays in Criticism**," by Matthew Arnold, 13-255
- "**Essays of Elia**," by Charles Lamb, 13-224
- "**Esse Quam Videri**," quotation from "De Amicitia," 8-296-A
- Essex, Robert Devereux**, earl of
  - Bacon and, 13-151
  - Elizabeth and, 6-54, <sup>\*</sup>57; 12-396
  - in Ireland, 6-153
- Established Church**, defined, 7-124

- Estaing, Charles Hector, Comte d'**, in American Revolution, 12-456
- "**Estates**," council of Leopold I, 6-264
- Estates General**, France, 6-170, 172, 176, 182, †187 fol.
  - dates of meetings, 6-182
  - efforts to control monarchy, 6-172, 176
  - first national assembly in France, 6-170
  - summoned by Louis XVI, 6-†187 fol.
- Este, Beatrice d'**, duchess of Milan, patroness of art, 11-154
- Este, Ippolito d'**
  - Ariosto and, 13-65
  - Tasso and, 13-67
- Este, Leonora d'**, 13-†67
- Este, Lucretia d'**, 13-†67
- Este family**, relations with Tasso, 13-†67, †68
- Esterházy, Johann**, count, and Franz Schubert, 12-284
- Esterházy von Galantha, Nikolaus Joseph von**, prince, patron of Haydn, 12-273 fol.
- Estes Park**, valley in Colorado, 8-52-A
- "**Esther**," drama by Racine, 13-113
- Esthonia**, country, Europe, description, 6-†463-64; general data, 6-464-A
  - area, 6-464-A
  - battle with Danes, 6-410
  - climate, 6-464-A
  - costume; dancing; song festivals, 6-<sup>\*</sup>463
  - description and history of capital, 6-<sup>\*</sup>459, <sup>\*</sup>462
  - government, 6-464-A
  - independence, 6-439, 464
  - location, 6-464-A
  - maps, 6-600, 571
  - people, 6-464-A
  - physical features, 6-464-A, 463
  - trade, 6-<sup>\*</sup>459, 464
- "**Esto Perpetua**," quotation, 8-92-B
- Estrithsson, Sven**, king of Denmark, 6-410
- Etching**, art. process, 10-64, †65
  - famous etchers, 10-64
  - on glass, 12-31, 34, 38
  - Rembrandt famous for, 11-273; 10-64
- E-temenanki**, Ziggurat at Babylon, excavated, 5-16
- "**Ethan Frome**," realistic novel by Edith Wharton, 13-346
- Ethelbert**, Kentish king, and St. Augustine, 6-<sup>\*</sup>7, 9
- Ethelred I**, king of West Saxons, brother of King Alfred, 10-10
- Ethelred II**, the Unready, king of England, 6-12
- Ether**, anesthetic, effect on nerves, 2-397
- Ether**, chemical, boiling point: evaporation, 1-<sup>\*</sup>392, 405
- Ether of space**, wave theory, 1-†417-20
- Ethics**
  - Epicurean and Stoic, 13-11
  - Kant's system, 13-22
- "**Ethics**" of Aristotle, 13-9
- "**Ethics of the Dust**," by John Ruskin, 13-238

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Ethiopia**, *see* Abyssinia, Africa  
**Ethiopian race**, *see* Negritos; Negroes  
**Ethiopians**, people, rule of Egypt by, 5-69  
**Ethnology**, *see* Races of man  
**Ethyl chloride**, chemical used as refrigerant, 1-408, 409  
**Ethylene**, chemical, in agriculture, 2-219; in plastics, 10-553; fractioning tower, 8-\*383  
**Etna, Mount**, volcano, Sicily  
 greatest eruptions, 6-476  
 started under ocean, 1-76  
 Vulcan's forge under, 1-75  
**Etoile, place de l'** (square), Paris, 11-\*291  
**Etruria**, ancient country in Italian Peninsula, main article, 5-†189-94; *see also* Etruscans  
**Etruscans**, people, main article, 5-†189-94  
 architecture, 11-427, 430, 432  
 arts and crafts, 5-†190-94; 11-62  
   bronze work, 12-\*15, †18, †19, 9-\*420  
   goldsmithery, 5-\*192, †193; 12-\*82, 84  
   jewelry, 5-\*192, †193; 12-\*117, †121-22  
   mirrors, 12-\*15, 18  
   portraits, 11-†62  
   pottery, 12-\*52, 54; 5-\*190, \*191  
   sculpture, 5-\*191; 11-\*62, 12-†18  
 attempt to recapture Rome, 12-340  
 chariot, 10-\*144; 5-\*189  
 furniture made by, 12-†180  
 government, 5-191  
 in Rome, 5-198, 199, 200, 202, 204  
 influence on Romans, 11-†62  
 language, 5-192  
 life and customs, 5-193  
 racial origin, 5-189  
 tombs, 5-\*191, 192, \*194  
 trade, 5-191, 192, 194  
**Etzel**, king, in "Nibelungenlied," 14-315  
**Euboea**, district of Greece, on map, 5-\*150  
**Eucalyptus**, *see* Gumwood  
**Euclid**, mathematician, main article, 13-†373-74  
 arithmetic written by, 10-423  
 reply to Ptolemy I, 13-\*373, 374  
**'Eugen Onegin,'** opera by Tschaikevsky, 12-314  
**Eugene**, Oregon, university at, 8-324  
**Eugénie**, Empress of the French, styles created by, 9-\*10  
**"Eugénie Grandet,"** novel by Balzac, 13-128  
**Euphrates River**, Asia, 5-76  
 irrigation along banks, 10-529  
 length, 10-253  
 maps, 5-†76, 582  
 transportation, 10-263  
**Euphrosyne**, one of Three Graces, 4-411  
**Eurasia**, 5-336-B  
**"Eureka"**  
 meaning, 1-470  
 motto of California, 8-42-B  
**Eureka State**, 8-42-B  
**Euripides**, life and works, main article, 13-†36-38  
 activity of period, 5-172  
 Aristophanes makes fun of, 13-39  
 statue, 13-\*38

**Europe**, general data, 6-162-C, 162-D  
 animals, 6-162-D  
 area, 6-162-C  
 civilization; spread of, 5-271  
 climate, 6-162-C  
 cotton industry, 9-29  
 famine prevented by potato, 9-143  
 highest and lowest altitudes, 1-25  
 historical biography  
   *see names listed in Contents Volume 12*  
 history  
   Asiatic conquests threatened, 5-403, 412  
   culture after fall of Rome, 11-83, 87  
   feudalism, 5-293, †301 7, 311, 7-351  
   Middle Ages, peoples, 5 \*265  
   waves of migration, 5-262, 264-71, 289, †290, 6-†206, 258  
   torn by revolutions, 1848, 6 285  
   federation of countries formed, 6-555  
 Ice Age, 1-59, 61  
 islands, 6-162-C  
 joined to Africa in Pleistocene, 3-61  
 lakes, 6-162-C  
 language groups, 5-267  
 language influenced by Latin, 5-270  
 location, 6-162-C  
 maps, 6-571, 5-573  
   before time of Columbus, 7-\*115  
   Charlemagne's empire, 5-\*265  
   Western Europe, 100 B.C., 6-\*165  
**midget countries**, 6-†466-69  
 minerals, 6-162-C  
   coal deposits, 9-438  
 mountains, 1-29; 6-162-C  
 people and language, 6-162 17  
   racial strains, 6-162 D, 5 267, 269, 270  
 physical features, 6 162 C  
   geography during Pleistocene epoch, 3 61  
 political divisions, 6 162 C  
 religion, 6-162-D  
 rivers, 6-162-C  
 roads, 10 -151, 156  
 soil aided by chemicals, 10 -546  
 trade, 10-234-35, 236 fol  
 transportation by rail, 10-189  
 vegetation, 6-162 D  
 waterways, 10-253-63  
*see also countries of Europe, as France; Spain*  
*also World War II, 6-†494 564*  
**European Federation**, formed, 6-555  
**European mute swan**, bird, 4-\*113  
**European Recovery Program**, 7-343-B; 6 562  
**European ruff**, bird, 4-\*114  
**European War (1939-1945)**, 6-108, 202, 241, 346, 355, 390, 407, 416, 443, 454, 457, 469, 463, 464, 469; 5-73, 387, 414, 491, 541, 560; 7-28, 343; *see also World War II, 6-494 564*  
**European white stork**, bird, 4-\*195, \*196  
**Eurpium**, element, symbol, atomic no. and atomic wt, 1-\*551  
**Eurus**, east wind, 14-434

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- "Euryanthe,"** opera by Carl von Weber, 12-282
- Eurydice and Orpheus,** mythological characters, 14-432
- "Eurydice Bitten by the Snake,"** painting by Bryson Burroughs, 11-371
- Eurypterida, crustaceans,** in prehistoric times, 3-10, 19, 24
- Eurystheus,** Hercules slave of, 14-426
- Eurytion,** centaur, 14-447
- Eusebius,** story of St. Catherine by, 13-526
- Eustachian tube,** anatomy, 2-304  
relation to hearing, 1-448
- Euterpe,** muse, 14-412, 12-205
- Euterpe Society,** Norway, 12-304
- Euxine Sea,** ancient name for Black Sea, 5-177
- "Evan Harrington,"** by George Meredith, 13-263
- Evangelical Union,** Protestant league, in Germany, 6-214
- "Evangeline,"** by Longfellow, 13-303  
land made famous by, 7-8  
subject of, 8-142
- Evangelists,** in the Bible, symbols, 11-27
- Evans, Sir Arthur**  
excavations in Crete, 5-17, 143  
Cnossus uncovered, 11-31
- Evans, Mary Ann,** *see* Phot, George
- Evans, Rudolph**  
"The Golden Hour," sculpture, 11-373
- Evanston, Ill**  
decrease of automobile accidents, 2-447  
Northwestern University, 8-105
- Evaporated milk,** 9-338
- Evaporation and heat absorption,** 1-405, 408  
humidity important, 1-393
- Evaporator,** in gas refrigerator, 1-409, 410
- Evatt, Herbert V.,** Australian statesman, 5-560-1
- "Eve,"** statue by Margaret Hoard, 11-373
- "Eve of St. Agnes, The,"** by John Keats, 13-231
- "Evening,"** statue by F. W. Ruckstuhl, 11-375
- "Evening Post,"** New York, edited by William Cullen Bryant, 13-298
- Evening primrose,** effect of sunlight on, 2-194
- Evening star,** 1-146
- "Ever normal granary,"** 8-121
- Everest,** highest known mountain in Himalayas, 1-25, \*26, 29, 5-432, 441  
map, 5-586, 1-3
- Everglade State,** nickname for Florida, 8-76-A
- Everglades,** Florida swamp land, 2-262; 8-69, 76  
Indians in, 8-70  
vegetation, 2-262
- Everglades National Park,** Fla., 7-409; 8-76 A
- Evergreen State,** 8-428-A
- Evergreen trees,** main articles, 2-191-99, \*266-69  
forest fires destructive to, 2-246  
forests, 2-196  
in winter, 2-23  
live oaks, 2-160  
other than conifers, 2-99
- Everlasting Compact,** Switzerland, 6-249
- Everlasting League,** Switzerland, 6-248, 250
- "Everlasting Mercy, The,"** by John Masefield, 13-270
- "Every Man in His Humour,"** by Ben Jonson, 13-163
- "Everyman,"** morality play, 12-327
- Evil**  
Christian Science's explanation, 13-558  
how early philosophers account for, 13-12  
Lobnitz's theory, 13-15
- Evolution**  
contributors to theory  
Darwin, 2-319; 13-434, 436  
Lamarck, 13-418  
Spencer, 13-24  
Wallace, 2-319  
development of elephant's trunk, 3-54  
horse, 4-507  
human skeleton, 2-319  
primitive skulls, 5-30
- Examinations,** Chinese mandarin, 5-319, 320, 334
- "Examiner,"** paper edited by Leigh Hunt, 13-231
- Excalibur,** Arthur's sword, 14-403
- Excavation,** archaeology, 5-1
- "Excelsior,"** by Longfellow, 13-301, 303
- "Excelsior,"** motto of New York, 8-284-A
- Excelsior State** (New York), 8-248-A
- Excelsiors,** nickname for New Yorkers, 8-284-A
- Exchange** (Bourse), Brussels, 6-349
- Exchange, stock,** *see* Stock exchange
- Excise tax,** U. S., 7-377
- Excommunication,** Henry IV, 5-296  
Frederick II, 5-299
- Excretory organs of body,** 2-366
- "Execution of Maximilian,"** painting by Manet, 11-311
- Executive functions** of government, 7-357, 358
- Executive Mansion,** *see* White House
- Exekias,** Greek vase painted by, 11-36
- Exercises, physical,** value and kinds of, 2-415-17  
effect upon heart beat and flow of blood, 2-377, 378, 379  
fencing, 14-512-14  
gymnastics, 2-415, 416  
swimming, 14-534-40  
*see also* Athletics, Sports and games
- Exeter,** early New Hampshire colony, 8-237
- Exhaust** from automobile engine, 10-287
- Exhaust manifold,** Diesel engine, 10-276
- Exhaust pump,** air, operation, 1-465
- Exhaust stroke,** of automobile, 10-282
- Exmoor,** English moor, 6-108-B
- Exodus,** book of Bible, quotation, 9-56
- Expansion of matter**  
air, 1-398  
caused by heat, 1-476, 477-83  
rocks, 1-41  
substances listed according to rate of expansion, 1-481

The asterisk (\*) refers to picture and its explanation only. The obelus (†) refers to illustrated text.

**Experiment**, in science, 13-189

**Experiment stations**, Department of Agriculture, 7-380; 8-465

**Explorations**

African, 5-466, 460, 461, 464, 468; 13-552  
coast; earliest, 5-446; 10-167

**Antarctic**, 13-†503-12, 489

**Arctic**, 13-†493-502, 490

Australian, 5-550, 552, 553

earliest in history, 5-56

English language spread by, 10-15

Portuguese, 6-340; 13-81

Sahara, 5-453

*see also* Explorers and explorers by name, as

De Soto, Hernando; Henry the Navigator

**Explorers**

biographies, 13-445-512, 551-54

Balboa, 13-†458-59

Cabot, 13-†471-72

Cartier, 13-†473-74

Champlain, 13-†481-82

Columbus, 13-†447-55

Cook, Captain, 13-†488-90

Cortes, 13-†467-70

Da Gama, 13-†460-61

De Soto, 13-†464-66

Diaz, 13-456

Hudson, Henry, 13-475

Joliet, 13-487

La Salle, 13-†485-86

Lewis and Clark, 13-†491-92; 7-†220

Livingstone, 13-†551-54

Magellan, 13-†462-63

Marco Polo, 13-†445-46

Marquette, 13-†483-84

Raleigh, Sir Walter, 13-†478-80

Vespucius, Americus, 13-457

*see also* in index names of explorers, as Livingstone; Raleigh, Stanley

**Explosions**, causes of, 10-415, 418

automobile engine, 10-287

**Explosives**, main article, 10-†415-18

Chile saltpeter used in, 10-546

nitroglycerine used in, 10-417

uses, 10-†416, 417

guns, 10-360

**Exponent**, algebra, 10-433

**Exposition**, in music, 12-236

**Express wagon**, how to make, 14-†45

**Expressionism**, 12-334

**Extensive farming**, 7-461

**Extensor muscle**, anatomy, 2-\*328, 329, \*331

**Extinct animals**

aurochs, 4-390

mastodon, 4-†344

moa (bird), 5-532

South Africa, 5-475

Steller's sea cows, 4-442

*see also* Prehistoric animals

**Extra-territoriality**, in China, 5-332

**Eyck, Hubert van**

love of nature, 11-140

paintings, 11-194-95, 198

**Eyck, John van**, paintings, 11-†195-96, 198

paintings, 11-\*191-95

altarpiece; triptych, 11-\*193

Arnolfini and wife, 11-\*195

Cardinal della Croce?, 11-\*194

"Madonna of Chancellor Rollin, The," 11-\*191

**"Eye for an eye,"** principle of, in Babylonian law, 5-86

**Eyeball**, 2-†296-300

in relation to muscles, 2-\*298

**Eyebrows**, 2-290, 300

**Eyed cribella**, starfish, 3-135

**Eyeglasses**, use of, 1-437, †438

**Eyelashes**, 2-290, 300

**Eyelid**, 2-\*299, 300

**Eyes, structure and functions**, main article, 2-†295-300, color plate, \*278; 1-†436

action of rods and cones, 2-298

aid to balance, 2-284

bone protection, color plate, 2-\*278

chart for testing vision, 2-439

color vision, 1-†438-41

theory, 1-440

compared with camera, 1-†436, 437, 2-†296-98

defective vision, causes and remedies, 1-†437-38

delicate organs; how protected, 2-292, 300

how to bandage, 2-\*405

imperfect, 2-298, 299, 300

iris gives color to, 1-437

lacrimal apparatus, 2-\*292, 299, 300

Mongolian, 5-336-C

nerve endings, 2-292

*see also* Sight

**Eyes of animals**

cat, 4-286, 484

fishes that see in two directions, 3-202, 2-437  
\*210

fox, 4-303

insect, 3-†273, 279, 358, 397

lizard, 3-448, \*456, 461

owl, 4-\*10, †194

snake, 3-482

spider family, 3-406, \*412

starfish, 3-130

**"Eyes of the army,"** scout airplanes, 10-368-A

**Eyesight**, *see* Eyes, Sight

**Eylau, Battle of**, 6-197

**Eyre, Edward John**, explorations in Australia, 5-552

**Eyre, Lake**, Australia, feet below sea level, table, 1-25

map, 5-601, F5

**Eystein**, king of Norway, 6-384

**Eyton tree duck**, 4-\*121

**Ezzelino da Romano**, Italian tyrant, 6-\*297

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



- "F. F. V's,"** First families of Virginia, 8-418-A  
**"F. F. V's,"** nickname for Virginians, 8-418-A  
**Fabian Society,** English moderate socialist organization, 13-271  
**Fabian tactics,** origin of term, 5-216  
**Fabius Maximus, Quintus** (Cunctator), Roman general, in Second Punic War, 5-216; 12-354  
**Fables,** definition and origin, 13-42, 43 (*see also* Contents Volume 14)  
 Aesop's 13-41, 42  
 La Fontaine's version, 13-115  
 retold in "Tanzy and Bobbles on Fable Island," 14-†256-308  
**Reynard the Fox,** 14-†323-28  
**"Fables,"** by Dryden, 13-174  
**Fabiano, Gentile da,** 10-151; 11-172  
 admired by van der Weyden, 11-200  
 procession of the Wise Men, painting, 11-139, 140  
**Façade,** architecture, 11-470  
**Facets,** of diamond, 9-†430  
**Facial disk** of owl, 4-194  
**Facio, Nicholas,** use of jewels in watches, 10-468  
**Factograph,** camera, 10-452  
**Factories and factorial systems,** 7-566-67, 569, 571  
 advantages of modern transportation, 7-501  
 automobile, 8-\*308  
 camera assembly, 8-\*272  
 choice of factory site, 7-447, 526  
 effect of business cycles, 7-545, 546  
 Dayton, Ohio, 7-\*565  
 furniture factory, 7-\*498  
 growth in England; conditions, 6-84  
 clash with land owners, 6-95  
 growth in United States, 7-217, 241  
 health supervision, 7-\*437  
 Industrial Revolution, 7-435-36, 437-38  
**labor unions,** 7-†558-63  
 lack of, in South, 7-246  
 lighting, 7-\*438  
 lime, 9-\*384  
 machinery used in, *see* Machinery  
 mass production, 7-501, 566  
 modern, 7-439, †558  
 overproduction, 7-343  
 ownership under socialist government, 7-551  
 result of Machine Age, 11-516  
 Russia's workers, 6-442  
 safety precautions, 2-425-26, 427, \*429  
 scientific management, 2-426  
 shoe factory; division of labor, etc., 7-534  
 speed of production, 7-522  
 standardization of goods, 7-566, 574  
 starting a factory, 7-522, 526  
 steel, 8-\*310  
**Factories and factorial systems—continued**  
 working conditions, 6-84; 7-217, 241  
*see also* Corporations  
**Factory,** name for trade settlements in India, 5-378  
**Faenza, Italy,** center of pottery making, 12-58  
**"Faerie Queene, The,"** by Edmund Spenser, 13-150  
 "Jerusalem Delivered" model for, 13-68  
 Spenser reading to Raleigh, 13-\*149  
**Fahrenheit, Gabriel,** physicist, 1-208  
**Fahrenheit thermometers,** 1-†208  
 scale, 1-\*392  
**Faïence,** Egyptian pottery, 12-\*51  
**Faïence, majolica,** 12-58  
**Fainting,** treatment, 2-404  
 tight clothing a cause of, 2-338  
**Fair Deal,** Truman's slogan, 7-343-D  
**Fair God** (Quetzalcoatl), Aztec deity  
 legend, 7-69, 74, 91  
 temple of, 7-\*69  
**Fair Labor Standards Act,** 7-341-B  
**"Fair of the Iron Horse,"** at Baltimore, 10-183  
**Fairbanks, Charles W.,** vice president of the United States, 12-456-F  
**Fairbanks, Richard,** 10-87  
**Fairbanks, Alaska,** college, 8-15  
**Fairfax, Thomas,** third baron, in English Civil Wars, 6-66, 68  
**Fairfax, Thomas,** sixth Baron  
 land granted to, 8-432  
 land of, surveyed by Washington, 12-474  
**"Fairies, The,"** opera by Wagner, 12-294  
**Fairs**  
 Chicago, 1893; Century of Progress, 8-104  
 Connecticut, 8-59  
**Fairway,** golf course, 14-495, 498  
**Fairy armadillo,** animal, 4-455  
**"Fairy Queen, The,"** *see* "Faerie Queene, The"  
**Fairy ring,** mushrooms growing in a circle, 2-\*72  
**Fairy shrimp,** shellfish, 3-257  
**Fairy tales** 14-†176-308  
 Aladdin and His Wonderful Lamp, 14-†371-76  
 Ali Baba and the Forty Thieves, 14-†362-65  
 Babes in the Woods, 14-†179-81  
 Beauty and the Beast, 14-†238-40  
 Brother and Sister, 14-†186-87  
 Brownies, The, 12-†210-11  
 Cinderella, 14-†241-43  
 color plates, 14-frontispiece, 176, 182, 186, 192, 198, 200, 210, 220, 230, 236, 241, 249  
 Dame Holle, 14-†199-200  
 Elves and the Cobbler, 14-†201-2  
 Golden Goose, 14-†205-6  
 Goldilocks and the Three Bears, 14-225-26  
 Goose Girl, 14-†235-38

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Fairy tales—continued**

- Grimms', 13-283, 285  
 Hans Christian Andersen's, 13-86  
 Hansel and Gretel, 14-†196-98  
 Hop o' My Thumb, 14-†248-49  
 Jack and the Bean Stalk, 14-†190-91  
 Jack the Giant Killer, 14-†243-44  
 Jorinda and Jorindel, 14-†234-35  
 King of the Golden Mountain, 14-†214-17  
 King Throstlebeard, 14-†192-94  
 Little Mermaid, 14-†231-33  
 Little Red Riding-Hood, 14-†249-51  
 Little Tuk, 14-†207-8  
 Piper of Hamelyn, 14-†229-31, frontispiece  
 Puss in Boots, 14-†188-90  
 Rumpelstiltskin, 14-†227-29  
 Seven Gallant Swabians, 14-†219-20  
 Seven Ravens, 14-†195-96  
 Sinbad the Sailor, 14-†365-71  
 Sleeping Beauty, 14-245-47  
 Snow Queen, 14-†221-25  
 Snow-white and Rose-red, 14-†181-83  
 Snowdrop (Snow White and the Seven Dwarfs), 14-†176-79  
 Star Silver, 14-204  
 Story of Prince Ahmed, 14-†251-53  
 Tinder Box, 14-†183-85  
 Tiny Belle, 14-†202-4  
 Tom Thumb, 14-†217-19  
 Water Nix, 14-†253-54  
 White Cat, 14-†208-10  
 Wild Swans, 14-†211-13  
*see also* Fables
- "Faith Healer, The,"** drama by William Vaughan Moody, 13-354
- Fakirs, Hindu,** 7-96
- Falaise, Treaty of,** 6-112
- Falcons, birds,** 4-175
- Falkirk, Battle of,** 6-25; 12-382
- Falkland, Lucius Cary, viscount,** 6-154
- Falkland Islands, So. Atlantic Ocean,** 6-†492  
 Battle of, 6-492  
 birds, 4-221  
 map, 5-604
- Fall line,** 8-356, 411  
 Georgia, 8-80  
 North Carolina, 8-290  
 Virginia, 8-418
- "Fall of Icarus, The,"** painting by Peter Breughel, 11-\*190, 202
- "Fall of the House of Usher, The,"** by Edgar Allen Poe, 13-315
- Fall River, Mass.**  
 child workers, 8-175  
 trade and manufactures, 8-170, 173
- Fallen Timbers, Battle of,** 8-306
- Falling bodies**  
 energy released by, 1-339  
 Galileo's experiments and discovery of law, 1-292, †294-97; 13-397, \*398  
 move in straight line, 1-287, \*288  
 retarded by friction, 1-319

**Falling bodies—continued**

- speed of, table, 1-296
- Falling stars,** 1-†164
- Fallon Wild Life Refuge,** 8-234-B
- Fallow land,** 10-546
- Falls of the Ohio,** 8-137
- Falmouth, Maine, founding of,** 8-152  
 destruction, 8-152  
 timber exported, 8-153
- False faces, *see* Masks**
- Falstaff, Sir John, Shakespearean character,** 13-†158, \*159
- "Falstaff,"** opera by Verdi, 12-253, 300  
 guitar used in, 12-258-13
- Family**  
 Babylonian; power of father, 5-85  
 Chinese, 5-\*315, 318  
 Indian, 5-369  
 Mohammedan, 5-\*71  
 primitive, 5-†23 fol.  
 Roman, 11-64, 69  
   family honor, 5-199  
   saving important to, 7-580  
   state containing largest, 8-296-A  
   yearly expenses chart, 7-547
- Family Allowance Act, Canada,** 7-29-G
- Family Compact, government by, Canada,** 7-17
- Famous stories retold, *see* Contents Volume 14**
- Fan sabella worm,** 3-\*118, 120
- Fan-tailed pigeon,** 4-\*79
- Fan window, architecture,** 12-\*5
- Fancy work, *see* Things to make, needlecraft**
- Fandango, Spanish dance,** 7-\*234
- Faneuil Hall, Boston,** 7-\*362
- "Fanny's First Play,"** drama by George Bernard Shaw, 13-272
- Fantail, fish,** 3-226
- Far Eastern Commission,** 5-364-B
- "Far from the Madding Crowd,"** by Thomas Hardy, 13-264
- Faraday, Michael, life and work, main article** 13-†385-87  
 electromagnetic experiments, 1-\*503, 504  
 laboratory, 1-\*533  
 portraits, 1-\*503; 13-\*385
- "Faraway Princess, The,"** by Rostand, 13-137
- Farewell address, Washington's** 7-196
- "Farewell Symphony,"** by Haydn, 12-276
- "Farewell to Arms, A,"** by Hemingway, 13-351
- Fargo, N. D., industries,** 8-301
- Farinelli, Carlo,** 12-244
- Faris, Charles, coffeepot by,** 12-\*91
- Farm, *see* Farms**
- Farm Loan Act,** 7-316
- Farm machinery, *see* Machinery**
- Farm tools, manufacture in Illinois,** 8-103
- Farmer**  
 affected by depression, 7-459  
 business head essential, 7-457  
 profits from roadside markets, 9-\*151  
 uprising against "Big Business," 7-291  
*see also* Agriculture

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Farmer-general** in French history, 15-381

**Farmer-Labor party, American**, 8-197

**Farmhouse**, New England, 8-\*401

**Farming**, *see* Agriculture

### Farms

deserted and buried, 7-\*405, 406

granted by Homestead Act, 7-279

land value, 7-458

Shenandoah Valley, 8-\*410

tenant, 7-459, 8-203; *see also* Serfdom

terraced, of Peruvian Indians, 5-\*501

*see also* Agriculture; Farmer

**Farnese, Elizabeth**, 6-331

**Farnese Bull**, statue, 11-\*66

**Farnese Hercules**, statue, 11-\*66

**Faroe Islands**, No. Atlantic Ocean, climate;

life in, 6-485

map, 6-598

**Farragut, David Glasgow**, in Civil War, 7-260, 264

Dewey's admiration for, 12-540, 541

**Farragut Monument**, New York City, 11-364

**Farrel, James T.**, novelist, 13-355

**Farsightedness**, 1-437, †438, 2-298

**Fascism**, 7-554, 555

Austria, 6-277

Bulgaria, 6-368-A

France, 6-202

Greece, 5-182

Hungary, 6-290

"It Can't Happen Here," anti fascist satire, 13-351

Italy, 6-†310-12

Nazi policies compared with, 6-240

outside of Italy, 6-241

Poland, 6-454

Spain, 6-335

**Fascist Revolution**, 6-312

**Fashions in clothing**, *see* Costume

**Fast Day**, holiday, 8-242 B

### Fat

digestive-juice glands a cause of, 2-356

fat glands of skin, 2-289, 291

found in seeds, 2-129

storage in body, chart, 2-361, 362

used by cells, 2-362

*see also* Oil; Wax

**Fata Morgana**, mirage, 1-\*425

**"Fate of the Flimflam, The,"** by Eugene Field, 13-343

**"Fates,"** by Michelangelo, 14-\*451

**Fates**, in Greek mythology, 14-412

**Father Nile**, sculpture of, 5-\*40

**Father of American literature** (Washington Irving), 13-293

**Father of English prose** (John Wycliffe), 6-33

**Father of modern philosophy** (René Descartes), 13-14

**Father of the Constitution** (Madison), 7-194

**Father of Waters** (Mississippi River), 13-487

**Father Tiber**, statue, 5-208

**Father Time**, 10-\*459

**"Fathers and Sons,"** novel by Turgeneff, 13-93

**"Father's Curse, The,"** painting by Greuze, 11-\*285

**Fathers' Day**, origin and observance, 14-584

**Fathom**, measure, 10-374

**Fatima**, daughter of Mohammed, 5-398

**Fats**, *see* Fat

**Faulkner, Barry**, artist, painting by, 12-\*496

**Fault**, in mountain, cause of earthquakes, 1-81

**"Faust,"** drama by Goethe, 13-†282, 283

**"Faust,"** opera by Gounod, 12-307, 308

**Faustina**, wife of Marcus Aurelius, 13-57

**"Faustus, The Tragical History of Doctor,"** by Marlowe, 13-\*162, 163

**Favel**, Protestant leader, and Calvin, 13-548

**Favrile glass**, 12-77

**Fawkes, Guy**, 6-\*59, \*60, 62; 10-20

**Fawn-breasted bower bird**, 4-\*186

**Fayetteville**, Ark., 8-27

**Fayum Desert**, Egypt

Amenemhet's canal through, 5-60

prehistoric elephant, 3-52

**FBI** (Federal Bureau of Investigation), 7-378

**Faalty**, act of, 5-293; 6-20

**Fear**, danger to man, 2-423, 424, 427

**Fear, Cape**, N. C., 8-296

**"Feather,"** in rowing, 14-532

**Feather feet**, barnacles, 3-189

**Feather game**, 14-157

**Feather River**, Calif., 8-42

**Feather starfishes**, description, 3-135

Devonian period, 3-24

Ordovician period, 3-14

**Feather-tailed mouse**, 4-\*385

**Feathers**, kinds and uses, 4-12

birds hunted for, 4-235

Indian address, color plate, 7-frontispiece

on hats or clothing, prohibited by law, 4-146

used for pens, 4-149

**Februa**, Roman festival, 10-482

**February**, month, origin of name, 10-482

**Federal Board of Vocational Education**, 7-316

**Federal Bureau of Investigation**, finger printing, 2-\*289; 7-378

**Federal Capital Territory**, Australia, 5-560-A

**Federal Communications Commission**, 10-119, 7-381

**Federal Deposit Insurance Corporation**, 7-381

**Federal Farm Board**, created, 12-456-D

**Federal Farm Loan Act**, 7-316

**Federal government** *see* United States government and politics

**Federal Hall**, New York, 7-\*396

**Federal Reserve System**, U. S., 7-315

**Federal Security Agency**, U. S., 7-381, 423

**Federal Trade Commission**, U. S., 7-315

**"Federalist, The,"** written by Hamilton and Madison, 12-509

**Federalist party**, 7-195-200, 203, 207

Washington's sympathy with, 12-478

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Federated Malay states**, 5-430-B; *see also* Malay Peninsula  
map, 5-581
- Feelers of animals**, *see* Antennae
- Feeling**, *see* Senses and sensation
- Feet**, *see* Foot
- Feldspar**, china stone obtained from, 12-43
- "Felix Holt,"** by George Eliot, 13-261
- Fellahin**, Egyptian peasants, 5-73-B
- "Fellow,"** derivation and changes in meaning of, 10-18
- Felony**, defined, 7-388
- Felt**, manufacture and use, 9-†89-90, †92
- Feminism**, *see* Woman suffrage
- Fence**, New England stone, 8-†168
- Fencing**, main article, 14-†512-14
- Fénelon, François de Salignac de la Mothe**, member of Louis XIV's court, 12-412
- Fenians**, Irish organization, propaganda in America, 6-160  
raids against Canada, 7-28
- Feodor I**, czar of Russia, 6-428
- Feodor III**, czar of Russia, 6-429
- Ferdinand I**, Holy Roman emperor, rule, 6-261
- Ferdinand II**, Holy Roman emperor, 6-262, 263  
relations with Protestants, 6-†261  
Thirty Years' War, 6-263
- Ferdinand III**, Holy Roman emperor, 6-263
- Ferdinand I**, emperor of Austria, 6-269, 285
- Ferdinand I**, king of Castile, defeats Moors, 6-322
- Ferdinand III**, king of Castile and Leon, 6-322
- Ferdinand IV**, king of Castile, 6-†320
- Ferdinand V** (the Catholic), king of Castile, founder of Spanish monarchy, 6-322  
aids Columbus, 13-†448 fol.; 7-114  
Boabdil delivers keys to, 6-†325  
flag, 14-573  
tomb in "Royal Chapel," 12-†7
- Ferdinand VI**, king of Spain, 6-331
- Ferdinand VII**, king of Spain, reign, 6-331, 332
- Ferdinand, Francis**, *see* Francis Ferdinand
- "Ferdinand Count Fathom,"** novel by George Tobias Smollett, 13-191
- Ferguson, Patrick**, British major in Revolutionary War, 8-368
- Fermentation**  
bacteria and fungi produce, 2-19  
prevented by pasteurization, 13-367
- Fernando**, *see* Ferdinand
- Ferney, Patriarch of** (Voltaire), 13-118
- Ferns and fern allies**, main article, 2-†87-92  
life cycle, 2-†89  
prehistoric, 1-†343; 2-†1, †2  
Carboniferous period, 3-29  
Devonian fossils, 3-†23  
Fossil Cycad National Monument, 7-†419, 420  
tree ferns, 2-†90  
uses, 2-90
- Ferrello, or Ferrer, Bartolomé**, Spanish explorer, 8-326
- Ferrer (y Guardia), Francisco**, Spanish radical leader, 6-334
- Ferret**, animal, 4-†358
- Ferro-concrete**, *see* Reinforced concrete
- Ferry-boats**, 10-†140, †199  
steam, 10-221
- Fertile Crescent**, ancient land, Western Asia, 5-75  
becomes domain of Islam, 5-397  
location, 5-75, †76  
map, 5-†88  
peoples, 5-75, 114  
subject to Assyria, 5-92  
subject to Rome, 5-218
- Fertilization** in plants, 2-84, 103, 104
- Fertilizers**, 1-97  
bacteria, 2-18  
chemical, 10-545-46  
effect upon leaf coloring, 2-45  
fish used as, 9-370; 13-476  
Georgia's trade in, 8-83  
legumes used as, 10-546  
made at Muscle Shoals, 1-370, 374  
nitrates, 1-†537  
nitrogen, 1-537, 538  
on truck farm, 9-153  
seaweed used as, 2-69  
silkworms used as, 9-44
- Festival Playhouse**, Bayreuth, 12-296
- Festivals**, *see* Holidays and festivals
- Feterita**, cereal, 9-120
- Fetishes**  
African Negro, 5-†446  
totem poles, 12-96
- Fetlock** of horse, 4-508
- Feudalism**, main article, 5-†301-7; *other general references*, 5-293, 294; 6-20; 7-351  
act of fealty, 5-293; 6-20  
German lords, 6-207  
Japan, 5-347, 357  
knighthood, 5-307; *see also* Knights and knight-hood  
lord's domain, 5-302  
diagram, 5-†303  
tolls charged by lords, 5-311
- Feuds**, blood  
Albania, 6-366  
among Eskimos, 7-39  
Corsica, 6-472
- Feury, Jim**, portrait, 13-†511
- "F.F.V's,"** 8-418-A
- Fiammetta**, Boccaccio's heroine, 13-63
- Fibers**, anatomy  
muscle, 2-†327  
functions, 2-329-31  
nerve, 2-395, 397
- Fibers**, artificial, made from cotton, 10-546
- Fibers**, plant, derived from ferns, 2-92
- Fibrin** of blood, 2-348
- Fibrinogen**, blood protein, 2-348
- Fibrous tissue**, anatomy, 2-290

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Fiction**, *see* Contents Volume 14, *also* Drama; Fables; Fairy tales; Literature; Mythology
- "Fiddle-Dee-Dee,"** nursery rhyme, text, color plate, 14-174-D
- Fiddler beetle**, 3-334
- Fiddler crab**, 3-\*158
- Fiddler fish**, 3-\*206
- "Fidelio,"** opera by Beethoven, 12-258 A, 280
- Field, Cyrus W.**, Atlantic cable laid by, main article, 10-†102-6  
portraits, 10-\*101, \*102
- Field, David**, portrait, 10-\*101
- Field, Eugene**, life and works, main article, 13-†343-44  
monument to, 13-\*344  
portrait, 13-\*343
- Field, lacrosse**, 14-493
- Field and track sports**, major, main article, 14-†471-76  
*see also* Sports
- Field artillery**, World War I, 10-362
- Field coils of dynamo**, 1-507
- Field corn**, 9-106
- Field magnet**, of dynamo, 1-\*502
- Field of the Cloth of Gold**, France, 6-\*44; 12-392
- Field sparrow**, 4-86, \*91  
graph of song, 4-\*5
- Fielding, Henry**, life and works, main article, 13-†187-88, 116
- Fielding in baseball**, 14-505, 508
- "Fiesco,"** by Schiller, 13-278
- Fiesole, Giovanni da**, *see* Angelico, Fra
- Fiesole, Mino da**, sculptures, 11-138  
"Virgin and Child with saints," 11-\*137
- Fife**, small flute, 12-258-A
- "Fife Player, The,"** painting, 11-\*340, 341
- Fifteen, The** (Jacobite Rebellion), 6-130; 8-327
- "Fifth Column,"** in World War II, 10-364
- "Fifth Symphony,"** by Beethoven  
bass viol used in, 12-258  
double bassoon used in, 12-258-A  
violoncello used in, 12-258
- "Fifty-four Forty or fight!"** 8-327
- Fifty-niners**, in Western U. S., 7-\*276, 277
- Fig tree**, sacred to Buddhism, 13-519
- Fig wasp**, insect, pollinates caprifig, 2-†112
- Figaro**, Beaumarchais's hero, 13-121
- Fighting French forces**, 6-\*538
- "Fighting Téméraire, The,"** painting by Turner, 11-312, \*313
- Figurines**, pottery, 12-53  
Greek, 11-\*57
- Figwort family**, plants, 2-56
- Fiji Islands**, Pacific Ocean, description, 5-†528  
animal life  
iguana lizard, 3-451, 453  
kingfisher, bird, 4-50  
inhabitants, 5-521, †527-29
- Filament**, of electric lamp, 1-†525, 527; 10-392  
tungsten, 1-536
- Filament**, of flower, 2-†102, \*172
- Filibustering**, 12-456-C
- "Filibusterismo, El,"** by José Rizal, 5-568
- Filigree work**, gold and silver, 12-80, 82, 84, †122
- Filipinos**, people, Philippine Islands, 5-570;  
*see also* Philippine Islands, people
- Filler vases**, 12-\*48
- Fillmore, Mary**, 12-562
- Fillmore, Millard**, president of the United States, 12-456-B  
vice-presidency, 12-456-F
- Film, photographic**, 10-†449-51  
camera, 1-436  
coated with silver chloride, 9-395  
cotton liners used in, 10-546  
developing and printing, 10-\*450, †451  
early plates to modern film, 10-448  
in moving-picture camera, 10-503, 504, \*506  
inflammability, 10-334  
made from cellulose, 9-294
- Filter pump**, 1-464
- Filters, sand**, for purifying water, 10-542
- Fin-footed carnivores**, animals, 4-331
- Fin rays**, of fish, 3-195
- Financial agents**, in international trade, 7-511
- Finback whale**, mammal, 6-\*443, 447
- Finches**, birds, 4-†135-36, †124-30, 172  
baby bird being fed, 4-\*132  
color plate, 4-\*88  
Father Goldfinch feeding mate, 4-\*4  
nest, 4-\*83  
number of clans; how to distinguish, 4-83  
winter visitors, 4-86  
*see also varieties of finches, as* Goldfinch
- Fine arts**, *see* Architecture; Art; Music; Painting; Poetry; Sculpture
- Fingal** (Fionn), hero of Fenian legends, exploits in the Hebrides, 6-488  
exploits sung by Ossian, 6-145
- Fingal's Cave**, Staffa, Scotland, 6-488
- "Fingal's Cave Overture,"** by Mendelssohn, 12-288
- Finger**  
bandaging, 2-\*403, \*407  
bones and joints, 2-\*320  
how to bandage, 2-\*403, \*407  
nails, 2-†290, 291  
sucking, effect upon teeth, 2-311, 312  
tips; sense of touch, 2-291
- Finger erosion**, 7-469
- Finger Lakes**, New York, 8-266, 283  
formation, 1-61
- Finger nail**, *see* Finger, nail
- Finger prints**, 2-†289
- Finiguerra, Tommaso**, mastery of goldsmith's art, 12-88
- "Fink,"** strikebreaker, 7-563
- Finland**, country, Europe, description and history, 6-†456-57, †464; general data, 6-464-B; *see also* index World War II, 6-493  
area, 6-464-B  
climate, 6-464-B  
Constitution, 6-457

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Finland—continued**

- crusades to, 6-394
  - education, 6-464
  - farming, 6-456, \*475, 464
  - flag, color plate, 14—following 570, no. 24
  - government, 6-464-B
  - history, 6-†456-57
    - acquired by Russia, 6-430, 434
    - Esthonia aided by, 6-464
    - subjection to Sweden and Russia, 6-456, 407
    - wins independence; republic, 6-457
    - Russian invasion (1939), 6-457, 464
  - language, 6-456, 457
  - location, 6-464-B
  - maps, 6-600
    - on map of Europe, 6-571
  - merchant marine, number, 10-232
  - music and musicians, 12-256
  - people, 6-464-B
    - racial origin, 6-456
    - see also Finns
  - physical features, 6-464, 464-B, 456
  - products and industries
    - lumbering, 6-464-B, 456
    - peat, 9-437
  - reindeer, 6-\*464
  - rivers, 6-464-B
  - ski troops, 6-\*505
  - woman suffrage granted, 12-572
- Finland, Gulf of**, Baltic Sea, map, 6-507
- "Finlandia,"** by Jean Sibelius, 12-256
- Finn**, Irish hero, 6-144
- Finno-Ogric tongue**, 6-162-D
- Finns**, people, 6-464-B, 456
  - absorbed by Slavs, 6-424
  - in Esthonia, 6-463
  - language, 6-456, 457
  - racial origin, 6-456
- Fins**, of fish, 3-195
- Fionn**, see Fingal
- Fiords**, Norway, 6-\*372, \*382, \*383
  - description, 6-374; 7-110
  - formation, 10-237
  - most famous, 6-407-A
- Fir**, tree, needles, 2-98
  - generic name, 2-183
- Fire**, main article, 10-†330-36
  - bonfires, 10-†379-80
  - cause, 10-334; 13-381
  - chemistry of, 13-380, 381
  - danger in cane fields, 9-114
  - discovered by early man, 10-330-31
  - extinguishing, 1-†385
  - forest fires, 2-†241 fol.; 1-\*249
  - Greek mythology; Prometheus, 14-421
  - harmless, from Lycopodium powder, 2-92
  - hazard in cities, 7-394
  - importance to civilization, 10-334
    - value to primitive man, 5-23
  - in volcanoes, 1-\*10
  - kinds, 10-334

**Fire—continued**

- methods of starting
  - bacteria cause, 2-19
  - burning glass, 1-†430, 432
  - flint, 14-\*565
  - friction causes, 1-320, †382
  - matches, 10-332
  - primitive; without matches, 10-\*330, 331, \*333
    - directions, 10-\*333; 14-\*553
  - oil fields, danger to, 9-\*452, 455
  - prairie, 1-385
  - precautions, 2-448; see also Fire Prevention
  - rock cracked by, 1-41
  - rock made by, 1-11
  - sacred, of Rome, 5-204, 11-†429, 430
  - signals with fire and smoke, 10-†28-29
  - source of heat, 1-384
  - sun's fire; nature of, 1-4, 113
  - war machines throw, 10-358
  - world made of; Heraclitus' theory, 13-2
- "Fire Bird, The,"** ballet, by Igor Stravinsky, 12-255
- Fire-bricks**, 8-212; 9-378
- Fire damp**, in coal mines, 9-442
- Fire department**, city, 7-†394
- Fire engines**, 7-\*394, \*395
- Fire extinguisher**, run by photo-electric cell, 1-\*415
- Fire Hole River**, Wyoming, geysers near, 1-36
- Fire lookouts**, National Forests, 2-245, †247
- Fire pan** from Pompeii, 12-\*179
- Fire prevention**, 2-448
  - electrical safety devices, 1-524
  - fireproofing, 1-385
  - forest fires, 2-†240-47, 1-\*249
    - national forests, 2-245, †247
  - regulations in shipbuilding, 10-233
  - safety rules, 7-395
- Fire salamander**, amphibian, 3-429
- "Fire the Ephesian Dome,"** origin of saying, 5-185
- Fire-watchman**, mechanical, 1-\*415
- Fire worship**, 10-334
  - Persians, 5-102
- Firearms**, main article, 10-†358-67
  - ammunition, 10-358 fol., 416, 417
- Firebird** (oriole), 4-28
- Firefly**, insect, 3-\*342, 343
  - light of, 10-393
  - not a true fly, 3-357
- Firehead** (vermillion flycatcher), bird, 4-136
- Fireman's lift**, for carrying injured person, 2-401
- Fireplaces**, 10-380, †381
- Fireproofing**, 1-385
- Fires of Smithfield**, Protestant martyrdom, 6-47
- Fireside poet** (Longfellow), 13-301
- Fireworks**
  - danger of accidents, 2-448
  - magnesium in, 1-535
- First aid** in illness and injury, main article, 2-†399-412

The asterisk (\*) refers to picture and its explanation only The obelisk (†) refers to illustrated text.

**First aid--continued**

- accident treatment before doctor's arrival, 2-†399 fol.
  - ambulance team, England, 2-\*399
  - artificial respiration, 2-408, \*410
  - asphyxiation, 2-410
  - bandages, 2-†411-12
    - broken bones, 2-\*407
    - elbow, 2-\*401
    - hand and fingers, 2-\*403
    - head and chin, 2-\*405
    - slings, 2-\*411
  - bleeding, 2-406
  - broken bones, 2-†406-8
  - bruises, 2-402
  - burns and scalds, 2-404
  - choking, 2-402
  - cuts, scratches, wounds, 2-405
  - dislocations, 2-406
  - drowning, 2-†408-10
  - electric shock, 2-410
  - fainting, 2-404
  - frostbite and freezing, 2-404
  - heat exhaustion, 2-404
  - hiccups, 2-403
  - ivy or oak poisoning, 2-403
  - methods of moving victim, 2-†400-1
  - nosebleed, 2-403
  - poisoning, 2-408
    - ivy or oak poisoning, 2-403
  - scalds and burns, 2-404
  - snake bite, 2-408
  - splinters, 2-405
  - sprains, 2-402
  - strains, 2-402
  - sunstroke, 2-404
  - tourniquet, 2-406
  - see also* Public safety
- First Church of Christ, Scientist, The**, 13-\*555
- "First Commission, The," painting**, 14-\*59
- First Internationale**, 7-550
- First Ladies of the Land**, wives of presidents, main article, 12-†558-64
- First magnitude**, star of, 1-170
- First modern man**, (Petrarch), 13-62
- First Symphony**, by Schumann, trombone used in, 12-258-13
- Firth of Forth**, Scotland, cantilever bridge, 10-\*211
- Fish**, main articles, **fresh-water**, 3-†220-42; **marine**, †194-215; **migratory**, †244-52
- adapted to life in ocean depths, 1-305
  - Agassiz's studies, 13-432
  - airplane modelled after, 10-\*315
  - anatomy, 3-†195-96, \*233
- aquariums**
- amateur; making and care of, 14-†2-5
  - public, 3-†217-20
  - blind; sense of touch, 3-257
  - breathing, 3-†196
  - organs of, 3-252
  - by-products, 9-370

**Fish--continued**

- carry light-giving bulb for bait, 3-208, \*209
  - color plates, 3-\*86, \*87, \*142, \*198, \*214
  - colors, 3-217, 227
    - changing, 3-170, 204, 205
    - see also* below protective coloration
  - defense and protection, means of, 3-205
  - destruction by other fishes, 4-361
  - diagram, 3-\*233
  - differences in "temperament," 3-224
  - early Christian symbol, 11-74
  - eggs, nesting, and young, 3-208 fol., 228, 242, \*244, 245 fol., †256, 260, 261
  - electricity generated by, 3-198, 201
  - enemies, 3-249
  - explode when brought from deep sea, 10-524
  - Eyes that see in two directions, 3-202, 204, \*210
  - fifth class of vertebrates, 3-†68
  - food of brook fishes, 3-233
  - fossil, 3-3
  - four-eyed fishes, 3-\*134
  - gills, 3-†196, \*233, 252
  - homes in sponges, 3-84
  - locomotion, 3-245
  - luminescence, 3-\*194, 208
  - mating season, 3-227
  - prehistoric
    - Carboniferous period, 3-30
    - Devonian period, 3-\*14, \*19, 21, 23
    - Eocene period, 3-51
    - first appearance on earth, 3-64
    - fossils, 3-\*14, \*19, \*21
    - Silurian period, 3-19
  - preservation: packing and canning, 9-\*366-69, †370
  - protected by sea tentacled creatures, 3-94, 111, \*112
  - protective coloration and devices, 3-\*109, 194, \*200, 202 fol.
    - color plates, 3-\*142, \*214
  - resistance to pressure of water, 1-67
  - shellfish, *see* Shellfish
  - smelling organs, 3-73
  - sources**, 9-†361-70
    - fresh-water, 9-366
    - salt water, 9-†366-69
  - symbol in Christian art, 11-74
  - taste organs, 3-242
  - use of air bladder, 3-245
  - uses for man, as food, 9-†366 fol.
    - fertilizer, 9-370; 13-476
    - see also* above by-products
  - see also* Fisheries; Fishing; and classes and names of fishes, as Shellfish; Stickleback
- Fish and Wild Life Service, U. S.**, 7-378
- Fish crow**, bird, 4-228
- Fish duck** (merganser), 4-120
- Fish hawk**, bird, *see* Osprey
- Fish ladder**, over Grand Coulee Dam, 3-\*244
- Fish wheel**, how used, 9-364
- Fisher, D. D., Dr.**, song by, 8-404

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- "Fisher Boy, The,"** statue by Hiram Powers, 11-<sup>\*</sup>375
- "Fisher Maiden, The,"** novel by Björnson, 13-98
- Fisher marten,** animal, 4-357, <sup>\*</sup>358
- Fisheries,** most famous, 9-364, 365, 366
- Canadian, 7-<sup>\*</sup>20, <sup>\*</sup>27
  - Columbia River, 8-330
  - damage caused by squids, 3-170
  - largest fresh-water, 8-311
  - Louisiana, 8-145
  - Maine, 8-<sup>\*</sup>150, 151
  - Newfoundland Banks, 7-†31 fol.
  - Norwegian, 6-<sup>\*</sup>382, 383
  - salmon industry, 9-366, <sup>\*</sup>368; 8-14
  - sponge, 3-<sup>\*</sup>82, <sup>\*</sup>83, †86-87
  - Virginia, 8-415
  - see also* Fishing
- Fisheries, United States Bureau of,** 9-365
- Fisherman caddis worm,** 3-<sup>†</sup>3
- Fisherman's knot,** 14-<sup>\*</sup>555
- Fisherman's Union,** Newfoundland, 7-33
- Fishermen, deep-sea,** 9-<sup>\*</sup>361, 364
- countries famous for, 9-365
  - in literature, 9-365
  - New Stone Age, 5-<sup>\*</sup>33
- Fishes, constellation,** *see* Pisces
- Fishes, Age of,** *see* Devonian Period
- Fishhooks,** 9-362
- Fishing,** main article, 9-†361-70
- birds trained to fish, 4-†212
  - California's industry, 8-40
  - cave men, 5-29
  - Eskimos, 1-<sup>\*</sup>199
  - fish market, 9-<sup>\*</sup>370
  - "fish wheel," 9-364
  - fresh water, 9-<sup>\*</sup>365, 366, 368
  - Italy, 6-<sup>\*</sup>315-A
  - Izaak Walton's book on, 13-165, 166
  - Japan, 5-<sup>\*</sup>358
  - nets, drying, 7-<sup>\*</sup>29-N
  - New Jersey's industry, 8-247
  - Portugal, 6-<sup>\*</sup>337
  - primitive methods, 9-361, †362
  - salt water, 9-361, 362-67
  - shellfish, 9-<sup>\*</sup>369, 370
  - sport, 9-368
  - trawler, 9-†363
  - with kites, 14-499
  - see also* Fisheries
- Fishing grounds,** 9-366
- Newfoundland Banks, 7-32
  - Vest Fiord, 6-†382
- Fishing rod,** mechanical principle of, 1-327
- Fishing tackle,** fishes supplied with, 3-208, <sup>\*</sup>209
- Fisk University,** Nashville, Tenn., 8-369
- Fitch, Clyde,** playwright, 13-354
- Fitch, John,** invents steamboat, 10-<sup>\*</sup>219, 220
- Fitchburg, Mass.,** 8-174
- Fitzgerald, Edward,** translates "Rubaiyat of Omar Khayyam," 13-89
- Fitzgerald, F. Scott,** novelist, 13-351
- Fitzgerald, George Francis,** 10-115
- Fitzgerald, Gerald,** *see* Desmond, Gerald Fitzgerald, earl of
- Fitzmaurice,** of house of Desmond, leads Irish revolts, 6-152
- Fitzmaurice, James,** aviator, portrait, 10-<sup>\*</sup>324
- Fitzroy, Robert,** governor of New Zealand, 5-537
- Fitzsimmons, Caroline,** composer of music to "New York, Our Empire State," 8-284-A
- Fiume, Italy**
- claims on, 6-310, 314
  - d'Annunzio's struggle for, 13-71
  - Yugoslavia's dispute over, 6-364
- "Five, The,"** Russian composers, 12-254, 313
- Five Civilized Tribes,** 8-320 B
- Five-five-three (5-5-3) Treaty,** 7-484, 486
- Five-lined skink,** lizard, 3-459
- Five nations of the Iroquois League,** 8-269
- becomes "Six Nations," 8-275
  - supposed founder, 8-270
- Five-Power Treaty,** 7-338
- "Five Relations,"** Confucianism, 5-319
- Five Rulers,** legendary, of China, 5-314
- Five-Year Plan of Soviet Russia,** first and second, 6-440, 442
- Fixed pulley,** 1-<sup>\*</sup>325, 329
- Fixed stars,** 1-174
- Fjord,** *see* Fiords
- Flaccus, Quintus Horatius,** *see* Horace
- "Flag of Our Union, The,"** poem, 8-212-B, 138-B
- "Flag, Oration on Makers of the,"** 14-569
- Flagella** of bacteria, 2-12, <sup>\*</sup>13, 15
- Flageolet,** musical instrument, 12-258-A
- Flagler, Henry M.,** 10-200
- Flags, national, history and meaning,** main article, 14-572-75
- color plates, 14-facing <sup>\*</sup>571, facing <sup>\*</sup>572, following <sup>\*</sup>572
  - Denmark, oldest national flag, 14-573
  - story of Dannebrog, 6-410
  - Germany, changed by Nazis, 6-240
  - Great Britain, color plate, 14-facing <sup>\*</sup>572, 573
  - Siam, 5-428
  - Union of South Africa, 5-491
  - United States, color plate, 7-<sup>\*</sup>175; 14-facing <sup>\*</sup>571, †574
  - first flag run up at Oriskany, 7-162
  - first, made by Betsy Ross, 14-†574
  - inspiration to Francis Scott Key, 14-<sup>\*</sup>573
  - Lone Star of Texas, 7-236; 8-380
  - see also* subhead flag under states and countries
- Flags, Red Cross,** 7-428; 14-573
- Flags, signal,** 14-<sup>\*</sup>551
- Flagstaff, Ariz.,** 8-20; 1-159, 183; 13-407
- Flamboyant Gothic,** architecture, 11-466
- Flamingos,** birds, 4-†198, <sup>\*</sup>197
- nest building and breeding, 4-<sup>\*</sup>197, 198
  - Oligocene period, 3-53
- Flaminius, Caius,** Roman consul, 5-215
- Flanders, Counts of,** 6-347, 348

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Flanders**, district, Europe, description, 6-346 fol.; 11-193  
 a separate country during Middle Ages, 6-347  
 art, *see* Flemish art; Flemish crafts  
 centers of tapestry weaving, 11-197, 201  
 character reflected in art, 11-103  
 history, 6-346 fol.  
   added to Austrian domains, 6-260  
   plundered by the Spanish, 11-218  
   struggle between Catholics and Protestants, 11-217  
 map, 6-593  
 missionary in New World, 8-191  
 official tongue, 6-355-B  
 wool trade with England, 6-26  
*see also* entries under Flemish
- Flashes**, lighthouse signals, 10-229
- Flashing**, glassmaking process, 12-31, 72
- Flashlight**, operation, 1-†527
- Flasks**, glass, 12-\*37
- Flatboats**, 10-\*220
- Flaty Island**, Iceland, old church, 6-419
- Flatfishes**, 3-†202-4
- Flathead (Selish) Indians**, 8-328  
 Montana, 8-216
- Flathead Irrigation Project**, bird refuges, 8-220-A
- Flathead (Selish) Lake**, Mont., 8-220
- Flathead River**, Mont., 8-220
- Flattery Rocks Bird Refuge**, 8-428-A
- Flaubert, Gustave**, life and work, 13-132  
 and de Maupassant, 13-134  
 portrait, 13-\*132
- Flavio**, comedy character, 12-329
- Flavoring**  
 coal-tar products, 9-445  
 plants used for, 9-310  
 seeds used for, 2-168  
 spices, 9-206-9
- Flacus*, defined, 2-184
- Flax**, growth and preparation, main article, 9-†46-48; 6-\*162-A; 10-\*342  
 fibers separated by bacteria, 2-20  
 products derived from, 9-312  
 structure of stem, 2-\*8, 9  
 United States, 7-343-E  
 vegetable oil from, 10-547
- Flax festivals**, Latvia, 6-463
- Flea**, insect, 10-\*487
- Fleet base force**, U. S. Navy, 7-485
- Fleming, Sir Alexander**, 9-219-A
- Fleming, John Ambrose**  
 improves telephone, 10-113  
 invents vacuum tube, 10-118
- Flemings**, Teutonic people, 6-355-B
- Flemish art**, color plate, 11-fol. \*360  
 early artists employed by Duke of Burgundy, 11-103  
 painting  
   early, 11-124-25, †190-203  
   masters, 11-†216-28  
   studied by German painters, 11-206
- Flemish crafts**  
 furniture, 13-\*187  
 laces, 12-\*165, †168 fol.  
 tapestry, 12-142  
   weaving, 12-159; 11-197, 201
- Flemish language**, 6-346, 355-B  
 Reynard the Fox printed in, 14-324
- Flemish people and history**, *see* Flanders
- Flemish ship**, 10-\*165
- Flesh-eating animals**, *see* Carnivores
- Flesh-eating (insectivorous) plants**, main article, 2-†60-64
- Fletcher, John Gould**, poet, Imagist, 13-349
- Flettner, Anton**, invents rotor ship, 1-508
- Fleury, André Hercule de**, French cardinal, rules France, 6-186
- Flexner, Hortense**, quotation from, 13-348
- Flexor muscle**, 2-\*328, 329, \*331
- Flickers**, birds, 4-†71-72  
 color plate, 4-\*89  
 year round visitor, 4-124
- Flickertail State**, 8-302-A
- Flies**, insects, 3-†357-65  
 destructive to orange crop, 9-171  
 enlarged, 2-\*12  
 head of house fly, 3-\*273  
 Redi's experiments with, 2-278  
 tongue, 10-\*489  
 water flies, 3-†386-93  
 why they can walk on ceiling, 1-455
- Flight feathers** (quills), 4-13
- Flin Flon mine**, Canada, 1-379; 7-29-U
- Flint, Mich.**  
 automobile industry, 8-185  
 strike center, 8-186
- Flint, mineral**  
 fire made with, 1-\*382; 10-†332-33  
 in fossils, 3-14
- Flint River, Ga.**, 8-84
- Flintlock**, or gun, fire made from, 10-\*332
- Flippers**  
 penguins, 4-†218  
 seals, 4-328, 332 fol.
- Flittermice**, bats, 4-†271-76
- Floating**, 14-540; 1-467
- Floating bodies**, physics, main article, 1-†467-74
- Floating island**, vegetation, 2-264
- Floating plants**, 2-†199 fol.
- Flodden Field, Battle of**, 6-119
- Flood, Henry**, Irish leader, 6-156
- Floods**, 7-468  
 biblical, 5-†76; 11-25  
 control  
   Tennessee, 8-371  
   TVA's contribution, 8-368  
   Wilson Dam, 7-\*499  
 destruction by, 7-468; 1-\*236  
 forecast of, 1-278  
 Greek mythology, 14-436  
 Indiana, 8-115  
 Kentucky, 8-138  
 Mississippi, 8-205; 1-407

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Floods—continued**

Nile, 5-47

water used for irrigation, 10-528, 529, 531

Yellow or Hwang River, China, 5-316

**Floor coverings, 12-157; see also Carpets; Rugs****Flora**

festival honoring, 12-\*326

Greek painting, 11-†58

sculpture by Carpeaux, 11-\*345

**Flora and Zephyrus, in mythology, 14-\*434**

"Flora of France," by Lamareck, 13-418

"Flora of North America," by Asa Gray, 13-412

Floral clock, 10-\*464

"Floral Games, The," French poetry contest, 13-125

Floral parade, Pasadena, Calif., 7-606, 14-\*579

Floreins Altar, St. John's Hospital, Bruges, 11-\*196

**Florence, Italy, 11-113, †123; 13-60**

art and artists, 11-†122-47

Baptistery (San Giovanni), 11-124

Ghiberti's doors, 11-\*127, 128; 12-22, \*23

contest for doors, 11-125

cathedral (duomo), 11-\*483

campanile, 11-\*118

church of Or San Michele, 11-124, 128

Clothmakers' Guild, 5-310

Dante, 13-59, 60

Giotto's work in, 11-\*118, 119

ironwork, 12-\*5

knight's costume, 9-\*11

Laurentian Library, 10-556

Medici family, 6-301, 302

Lorenzo de Medici, 11-143, 147; 13-539

plague, 13-64

Renaissance architecture, 11-\*483, 484

Savonarola, 11-146, 147; 13-540

temperature, 6-315-B

"Florentine Singer," statue by Paul Dubois, 11-\*375

**Flores (Sunda) Sea, East Indies, map, 5-596****Florida, state, U. S., description and history,**  
main article, 8-†68-75; general data, 8-76-76-B

agriculture, 8-†71, 72, 74

avocado grown in, 9-194

fruit growing, 8-74

growing season, 1-211

sugar cane, 9-\*115, 116

truck gardens, 8-74; 9-\*150 fol.

alligator farm, 3-\*444

animal life: bass caught in waters, 3-\*239

bats, 4-274

birds

egret, 4-\*140, 146

ground dove, 4-†144

heron, 4-146

ibis, 4-\*148

rookery, 4-\*145

sanctuaries, 8-76-A; 4-\*3, 517

spoonbill, 4-148

crocodiles, 3-443

**Florida, animal life—continued**

snakes, 3-502

toads, 3-426

tortoises, 3-\*468

area, 8-76

canals, 8-72

capital and capitol building, 8-\*68

charities and correction, 8-76

cities, list, 8-76-B

climate, 8-76

counties, list, 8-76-B

education, 8-75

institutions of higher learning, list, 8-76

flag, 8-76-A

Florida National Forest, 9-309

history, 8-69 fol.

admitted to union, 8-71

"conquest" by Andrew Jackson, 7-221

De Soto's expedition, 13-464, †465

holidays, 8-76-A

Indians, 8-69, \*70, 71; 7-221

reservations, 8-76-A

industries, *see below* products and industries

interesting facts, 8-76-A

location, 8-76

map, 8-485

on United States map, 7-595

monuments, 8-76-A

Fort Marion, St. Augustine, 7-\*411, 412

Fort Matanzas, 7-412

motto, 8-76-A

name, 8-76-A, 69

nicknames, 8-76-A

parks, 8-76-A

physical features, 8-76, 68

lakes which fluctuate simultaneously, 1-92

largely built of coral, 1-57

mangrove swamps, 3-27

political facts, 8-76

products and industries, 8-†73, 74-75

phosphate rock, 1-97

sponge fisheries, 3-\*82, 86, 87

*see also* agriculture *above*

reservations, game and bird, 8-76-A

resorts, 8-74

rivers, 8-76

state bird, 8-76-A

state flower, 8-76-A

state song, 8-72-A

transportation, 8-72, 74

"Florida, My Florida," song, 8-76-A

**Florida, Territory of, 8-71****Florida, University of, building, 8-\*69****Florida cardinal, bird, 4-\*135****Florida gallinule (water chicken), 4-102****Florida grackle, bird, 4-91****Florida moss, 2-†150****Florida National Forest, turpentine production,**  
9-\*309**Florida nighthawk, 4-\*76****Florida parishes, 8-142****Florida Strait, southeast of Florida, 7-305**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



- Florida Waterway**, 8-76  
**Flounder**, fish, 2-202  
**Flour and flour mills**, main article, 9-†233-36  
   bleaching, 9-236  
   food value of flour, 9-102, 236  
   kinds of flour, 9-233, 236.  
     potato, 9-144  
     rye, 9-119  
     wheat, 9-102  
   milling centers, 9-236  
   modern mill, 7-\*552  
     Minnesota, 8-\*195  
   primitive peoples, 9-238  
   stone mills, 9-238, 239, \*241  
   windmill, 7-\*8  
   *see also* Bread  
**"Flour City, The,"** 8-280  
**Flourens, Marie Jean Pierre**, study of brain, 2-384, 390  
**Flower bud**, 2-132  
**"Flower City,"** nickname for Rochester, N. Y., 8-280  
**"Flower Fables,"** by Louisa May Alcott, 13-320  
**Flower fly**, 3-364  
**Flower-nosed bat**, 4-274  
**Flower of fishes** (grayling), 3-236  
**Flower peckers**, birds, 4-180  
**Flower-pot holder**, how to make, 14-†50  
**Flower stalk**, 2-†172  
**Flower State**, 8-76-A  
**Flowering dogwood**, tree, 2-\*276  
**Flowers**, main articles, 2-†101-4, †156-75  
   **Apetalae**, 2-†157-60  
     attraction of insects, 2-†110, 163  
     birds dependent upon, 4-30, 180  
     complete or perfect, 2-102  
   **Compositae**, 2-\*170, \*173-75  
     conditions affecting blossoming time, 2-†221-24  
     Costa Rica, 7-48  
     fertilization, 2-\*103, 104  
     flower myths, 14-†440-42  
   **Gamopetalae**, 2-†170-75  
     goddess of, Flora, 11-†58, \*345; 14-\*434  
     grasses, 2-\*178, 179  
     hothouse industry; Illinois, 8-104  
     hybridized, 2-233  
     in ancient jewelry, 12 \*117, \*120  
     irregular, 2-152  
     Japanese arrangement, 9-140  
     monocotyledons, 2-†144 fol.  
     Mothers' Day significance, 14-584  
     of American origin, 2-233  
     perfumes extracted from, 9-†299-302  
     pollination, *see* Pollen and pollination  
   **Polypetalae**, 2-†162-68  
     scent, where found, 9-300  
     smallest and largest, 2-†249-50  
     structure and functions, 2-†101-4, \*172  
     sweet-potato plant, 2-†172  
     used as food, 9-148, \*149  
   *see also* names of flowers as Daisy; Rose  
**Flowers, artificial**, how to make a rose, 14-†54  
**Flowery Kingdom**, *see* Japan  
**Fluke**, finlike organ of whale, 4-442  
**Fluor spar**, mineral, Illinois' production, 8-104  
**Fluorescent lighting**, 10-393  
**Fluorescent screen**, 10-490  
**Fluorine**, element  
   chemical behavior, 1-548  
   formation of molecule from atoms, 1-\*543  
   symbol, atomic no., and atomic wt., 1-\*551  
**Fluoroscope**, 10-493; 2-353, \*354  
**Flushed skin**, 2-292, 348, 381  
**Flushing**, Holland, 6-345  
**Flute**, musical instrument, 12-258-A  
   invented by Pan, 5-158  
   perfected as musical instrument, 5-159  
**Flute family of musical instruments**, 12-258-A  
**Fly**, insect, *see* Flies  
**Fly shuttle**, weaving, 10-344  
**Fly-up-the-Creeks**, nickname for Florida natives, 8-76-A  
**Flycatchers**, birds, 4-†42-45, †136-38  
   color plates, 4-\*24, \*25, \*184  
   nest building and breeding, 4-43  
   pee-wee, 4-64  
   scissor-tailed flycatcher, color plate, 4-\*25, \*137, 138  
   vermillion flycatcher, color plate, 4-\*24, 136-38  
   *see also* varieties of flycatchers, as Crested flycatcher; Kingbird  
**Flying and flying machines**, main article, 10-†312-28-V; 1-467  
   air service in war, 10-†364  
   China Clipper, 10-325-26  
   famous flights and flyers, 10-318 fol.  
   legends and dreams about, 10-†313-14  
   photographic surveys, 5-†432  
   trial flight of Wright brothers, 10-313, \*316  
   U. S. lighthouse service, 7-381  
   *see also* Aviation; Aviators  
**Flying buttress**, architecture, 11-\*463, 468  
**"Flying Cloud,"** clipper ship, record, 10-172  
**Flying doe**, kangaroo, 4-460  
**Flying dragon**, lizard, 3-450  
**"Flying Dutchman, The,"** opera by Wagner, 12-251, 294, 295  
**Flying fishes**, 3-\*126, 205, \*209  
**Flying fox**, bat, 4-275, \*276  
   pollination brought about by, 2-113  
**Flying frog**, 3-424  
**Flying gurnard**, fish, color plate, 3-102  
**Flying-jib sail**, 10-\*171  
**Flying lemur**, bat, 4-276  
**"Flying Machine,"** stagecoach, 10-146  
**Flying opossum**, 4-\*467, 469  
**Flying propeller**, how to make, 14-†39  
**Flying squirrel**, 4-†368  
**Flying stovepipe**, guided missile, 10-\*365  
**Flywheel**, automobile, 10-†288  
**Foch, Ferdinand**  
   commands Allied army, 7-324, 326  
   portrait, 7-\*324

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Foci**, of ellipse, 1-311  
**Focus of lenses**, 1-430, †432-34  
**Foehn**, wind, Austria affected by, 6-265  
**Fog**, 1-†237, †241-42  
     cause of, 1-407  
     London, 6-108-B  
**Fog horns**, ship, 10-†302  
**Fog signals**, 10-229  
**Fogo**, island, Cape Verde Islands, 6-491  
**Föhn**, wind, 6-254-B  
**Foils**, fencers' swords, 14-512  
**Folding machines**, book manufacture, 10-†61  
**Folk dancing**, Sweden, 6-†404  
**Folk etymology**, 10-23  
**Folk music**, 12-212, 220  
     basis for Liszt's rhapsodies, 12-246  
     inspiration for composers, 12-255-56  
     significance, 12-254  
**Folklore**  
     early means of weather forecasting, 1-†263-68  
     German, collected by the Grimm brothers, 13-285  
     *see also* Mythology  
**Folkungs**, house of, Sweden, 6-394  
**Follicles**, hair pits, 2-280, \*290  
**Follow my leader**, game, 14-174  
**Follow shot**, billiards, 14-†478, 480  
**Fomalhaut**, star, star maps showing:  
     Nov. and Dec., 1-178-1.  
     Sept. and Oct., 1-178-J  
**Fond de neige**, lace, 12-171  
**Fond du Lac**, Wis., manufacturing, 8-444  
**Fones**, Doctor, directions for brushing teeth, 2-316  
**Fonseca**, Gulf of, 7-48-A; map, 7-598  
**Fontainebleau**, France, château, 11-486, \*488  
**"Fonte Gaia"**, Siena, sculpture, 11-120  
**Food**  
     action of bacteria upon, 2-19, 20; 10-516  
     aureomycin doubles meat growth, 9-†216  
     calories, 2-366  
     camper's selection and care of, 14-†552, 554  
     carbohydrates, 2-40, 361  
     chart of food values, 2-359  
     chemistry's contributions, 10-545, 550  
     dehydrated, 9-231  
     digestion of, 2-†352-58  
     effect upon teeth, 2-316  
     energy, 2-366  
     enzymes make digestible, 2-53  
     fats, 2-361  
     flavors from coal-tar, 9-445  
     **food from animals**, *see* Contents Volume 9  
         and also names of foods, as Caviar; Liver  
     **food from plants**, *see* articles listed in Contents  
         Volume 9 and also names of plant foods,  
         as Oats; Rice  
     for the bird table, 4-15, 17, 125, \*126, 128  
     grasses an important source of, 2-177  
     home gardens, importance of, 9-†147  
     **how plants obtain**, 2-†40-46  
     hygiene, rules for eating, 2-419  
     sanitation, 2-420, 421

**Food—continued**

industries, *see* Contents Volume 9  
 industry in United States, 7-343-F  
 inspection  
     coffee and tea tasters, 9-132, \*139  
     fruit, 9-170  
     meat, 9-328  
     margarine, 9-373  
     milk testing, 9-†337, 338  
 in logging camp, 9-250  
 laws regulating  
     canning laws, 9-231  
     milk, 9-338  
 Liebig's discoveries, 13-388  
 life dependent upon, 1-373  
 necessity for chewing, 2-311, 312  
 need of "roughage" in, 2-367  
 oxidation of, produces energy, 2-334  
 prehistoric man, 5-23, 24, 28-29, 35  
 preservation  
     dried, 9-226, \*227  
     pasteurization of milk, 9-335, \*337  
     quick-freezing process, 10-519  
     with ice, 10-515, 516  
     with salt, 9-414  
     *see also* Canning  
 prices affected during wartime, 7-577  
 proteins, 9-198, 317, 347; 2-129, 359  
 seeds used as, 2-†124, 129  
 source of energy, 2-366  
 surplus utilized by chemist, 10-546  
 taste of, 2-†307-9  
 tested for purity, 1-†552  
     butter, 9-342  
     milk, 9-338  
 three main classes, 2-40  
**transformation and use by body**, 2-†360-67  
 variety made possible by canning, 9-229  
 vitamins in, 2-359, 363-65; *see also* Vitamins  
*see also* Cooking; Digestion; Nutrition; Recipes, and the names of foods, as Meat; Nuts  
**Food Administration**, World War I, 7-324, 332  
**Foolscap limpet**, mollusk, 3-145  
**Foot**  
     animals  
         birds, 4-13, 66, 151, 233, 238  
         camel, 4-†397, 398  
         centipede, 3-265  
         echinoderm, 3-130, 137, \*139  
         evolution of horse's, 4-†507  
         gorilla, 4-†246  
         kangaroo, 4-†461  
         millepede, 3-267  
         mollusk, 3-142 fol., 151, \*152, \*168  
         sea anemone, 3-91, 93  
         similarities and differences, 13-†435  
     arch, 2-319  
     bones, 2-†319, \*322-23, color plate, \*327  
     care of, when camping, 14-551, \*556  
     harm done by ill fitting shoes, 9-56  
     muscles, 2-†322, color plate, \*326

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Foot**, unit of measure, 10-375  
 not standardized in Middle Ages, 10-374  
 origin, 10-373  
 standardized by Romans, 10-374
- Foot-and-mouth disease**, vaccination, 13-368
- Foot-binding** of Chinese women, 5-†318, 322
- Foot pounds**, work measured in, 1-339
- Foot races**, 14-471, †472-76
- Football**, main article, 14-†515 18  
 field, diagram, 14-516  
 Notre Dame's reputation, 8-109  
 Rose Bowl game, 8-43  
 stadiums, 4-517
- Footstools**, ancient, 12-176, \*177, 181
- Footwear**, main article, 9-†54-64; *see also* Shoes
- "For Whom the Bell Tolls"**, novel by Hemingway, 13-352
- Forage**, 9-120
- Foraker, Mount**, peak, Alaska, height, 8-16
- Foraminifera**, animalcules, 3-†77-80  
 chalk formed by shells, 1-51; 3-44  
 limestone formed by, 3-51  
 limestone of pyramids contains, 1-51  
 ooze, 1-51  
 Ordovician period, 3-14
- Forbes, Edward**, experiment with starfish, 3-†133
- Forbidden City**, *see* Peiping
- Forbidden Land**, *see* Tibet
- "Forbidden Love"**, opera by Wagner, 12-294
- Force**, physics  
 and motion, 1-297, †307-13  
 and work, 1-336, 338, 339  
 applied force; lever, 1-†324 fol.  
 centrifuged, 1-310-11  
 electric, 1-503 fol.  
 friction, 1-†315-21  
 gravitational, 1-112, 302  
 lines of magnetic force, 1-\*502  
 overcome by machines, 1-†323-31
- Force pump**, operation, 1-465  
 Roman, 12-\*14
- Ford, Henry**  
 first automobile, 10-†278  
 inexpensive cars made by, 10-279
- Fordham Manor**, New York, sale, 7-\*536
- Fordney-McCumber Tariff Act**, 12-456-C
- Fore-and-aft rigged vessel**, 10-171
- Fore royal sail**, 10-\*171
- Fore-royal studding sail**, 10-\*171
- Fore skysail**, 10-\*171
- Fore-top gallant sail**, 10-\*171
- Fore-top gallant studding sail**, 10-\*171
- Fore-topmast staysail**, 10-\*171
- Fore-topsail**, upper and lower, 10-\*171
- Forecasting of weather**, *see* Weather, forecasting
- "Foregone Conclusion, A,"** by William Dean Howells, 13-332
- Forehand drive**, tennis, 14-466, \*468
- Foreign exchange**, *see* International exchange
- Foreign representatives abroad**, 7-373-74
- Foreign trade**, *see* International trade
- Foreigner State**, nickname for New Jersey, 8-252-A
- "Foreigners"**, nickname for people of New Jersey, 8-252-A
- Forel, Mt.**, Greenland, elevation, table, 1-25
- Foresail**, 10-\*171
- Forest fires**, 10-\*336; 2-†242 fol.; 1-385
- Forest Hills**, New York, tennis courts, 14-470
- "Forest Maiden, The,"** opera by Carl von Weber, 12-282
- Forest rangers**, 14-\*522, 567
- Forest Service**, U. S., 2-242, 247
- Forests**  
 acreage, U. S., 9-257  
 Baltic countries, 6-460, 464  
 Canadian, 7-\*13, 16, color plate, \*29-J  
 floods caused by cutting, 7-468  
 Germany, 6-241-B  
 kinds, 2-196  
 of the North, 2-196  
 petrified, 2-\*16, \*257; 7-406; 9-315  
 photographed from airplane, 10-452  
 prehistoric, 1-†343, \*345; 2-\*1  
 coal from, 3-28, 29; 9-436  
 reforestation; fire prevention, 2-†240-47; 7-467, 309, 310; 9-\*257; 10-328-F; 1-\*249  
 stalking and pathfinding in, 14-†561-68  
 tropical jungles, 2-258  
 uses, 9-245  
*see also* Lumber and lumbering
- Forge**, primitive, 5-\*36
- Forgeries**, literary, 13-204
- "Forgotten man,"** term used by Franklin D. Roosevelt, 7-340
- Fork-tailed drongo**, bird, 4-\*178
- Forked tongue of snake**, 3-482
- Formaldehyde**, aid to farmer, 10-546, 552
- Formentera** island, Balearic group, 6-471
- Formosa** (Taiwan), island, China Sea, 9-219  
 camphor, 9-†218, 219; maps, 5-593, 591
- Formosa oolong tea**, 9-136
- Formosa Strait**, Asia, map, 5-591
- Forres**, Scottish town, 13-564
- Forrester Island Bird Refuge**, 8-16-B
- "Forsaken Merman, The,"** by Arnold, 13-255
- Forsyth, Cecil**, quoted, 12-217
- Fort**, *see* names of forts, *as* Henry; Ticonderoga
- Fort Donelson National Military Park**, Tennessee, 8-374
- Fort Gibson**, Okla., Houston's life at, 12-515
- "Fort Hill,"** Calhoun's house, 12-\*520
- Fort Keogh, Wild Life Refuge**, 8-220-A
- Fort Knox**, Ky., gold stored at, 9-396
- Fort Leavenworth**, Kansas, army schools, 7-479-B
- Fort Malden**, Canadian national park, 7-29-Q
- Fort Meade**, Md., war prison at, 6-\*530
- Fort Peck Dam**, Montana, 8-220-A
- Fort Rouge**, on site of Winnipeg, 7-\*7
- Fort Sam Houston**, Texas, 12-555-F
- Fort Wellington National Park**, 7-29-Q
- Forth, Firth of**, estuary, Scotland, map, 6-575

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Fortifications**  
 log blockhouse, 12-\*470  
 medieval, 10-\*361  
 weapons for storming, 10-356, \*357, \*358
- Fortune Seekers**, people of Idaho, 8-92-B
- Fortune telling**, 14-†152
- "Forty-five, The,"** (Jacobite Rebellion), 6-130
- Forty-niners**, California pioneers, 9-†393, \*396; 7-239  
 Bret Harte writes about, 13-\*333, 334  
 panning gold, 7-\*238
- Forty Thieves, Ali Baba and**, fairy tale, text, 14-†362-65
- Forum of Trajan**, Rome, 11-65
- Forum Romanum**, Rome, 11-†436-38; 5-\*221, 226, \*231, \*244; 6-\*294  
 "golden milestone," 10-151
- Forums**, Rome, 11-438
- "Forward,"** motto of Wisconsin, 8-446-A
- Forward pass**, term used in football, 14-516, 518
- Fossil Cycad National Monument**, 8-364-A; 7-419, 420
- Fossils**, kinds; formation, 3-†5-6  
 animal  
   birds, 3-†43  
   Eohippus, prehistoric horse, 4-505  
   bones showing evolution, 4-\*507  
   fish, 13-432  
   foraminifera shells, 3-79  
   hairy mammoth, 3-†4  
   insects and spiders in amber, 3-6, \*18, 53  
   sea shells on mountain top, 1-\*20, 21  
 chalk formed of, 3-14, 44, 79; 1-51  
 dinosaur eggs, 3-\*39  
 Dinosaur National Monument, 7-421  
 earth's history revealed by, 3-2, †3  
 formation and preservation in earth's crust, 3-†62-63  
   found in layers of strata, color plate, 3-frontispiece  
 Fossil Cycad National Monument, 7-419, 420  
 hairy mammoth preserved intact, 3-†4  
 limestone made of, 1-51  
 Lyell's studies and classification, 13-430-31  
 Petrified Forest National Monument, 7-\*418, 421  
 petrified forests, 2-\*16  
 plant  
   coal beds reveal, 2-\*2; 3-6, \*29  
   diatom shells (algae), 2-69  
   fern in coal, 2-\*2  
   trees, 3-†5, 6; 9-437; 2-\*257  
 restorations  
   Cuvier, 13-424  
   dinosaurs, 3-\*40  
   prehistoric man; plasteline, 5-†24, \*25, \*27  
   rocks reveal, 1-39  
   sedimentary rocks contain, 3-3  
   South Dakota, 8-359, 360  
   *see also* Geology
- Foster, Stephen Collins**, composer, 8-138-A
- Foundry**, iron, 9-†400 fol.
- Fountain**, by Jacopo della Quercia, 11-126
- "Fountain, Joyous,"** Siena, 11-120
- Fountain of the Goddess Latona**, Versailles, 11-\*233
- Fountain of the Lions**, Alhambra, 1-\*47
- Fountain of Youth**, Ponce de León's effort to find, 8-69
- Fountain pen**, principle of, operation, 1-463
- Fountain shell**, 3-144
- Fountains**, Roman, 5-248  
 Bernini's, 11-188
- "Four, The,"** in French literary world, 13-113
- "Four Apostles, The,"** paintings by Durer, 11-\*210, 211
- "Four-Branch Tale,"** Welsh legend, 6-138
- Four-color printing**, color plate, 10-\*64
- Four-eyed fish**, 3-\*134
- Four-H Clubs**, 7-457, \*456; 9-\*144
- "Four Million, The,"** by O. Henry, 13-343
- Four Points**, Truman's, 7-343 B
- Four-wall handball**, 14-486
- Four Year Diet**, Poland, 6-452
- Fourdrinier machine**, 9-†277
- Fourment, Helen**, wife of Peter Paul Rubens  
 beauty of, in art of Rubens, 11-227  
 portraits, 11-\*223, \*224
- Fourteen Points**, Woodrow Wilson's, 7-327, 328
- Fourth dimension**, "space-time," 13-409
- Fourth of July**, 14-†585; 2-448
- Fowler's toad**, 3-\*415
- Fowls**, *see* Chickens; Ducks, etc.
- Fox, Charles James**  
 contemporaries and period, 6-81, †43, 201, 206
- Fox, George**, English religious leader, a Quaker, 8-334
- Fox**, animal, 4-†303-6
- Fox and geese**, game, 14-174
- Fox hunt**, 4-†303, \*498
- Fox Indians**  
 Illinois, 8-99  
 land grant, 8-317  
 Wisconsin, 8-440, 441
- Fox Islands**, No. Pacific Ocean, map, 8-560
- Fox River**, Wis. through Lake Winnebago to Green Bay, 8-439, 446  
 trading posts, 8-440  
 valley, 8-439
- Fox shark**, 3-198
- Fox snake**, 3-\*493
- Fox squirrel**, 4-368
- Fox-tailed monkeys**, 4-264
- Foxglove**, medicinal plant, 9-219
- Foxhound**, Warwickshire, 4-\*495
- Fra Angelico**, *see* Angelico, Fra
- "Fra Diavolo,"** opera by Daniel François Esprit Auber, snare drum used in, 12-258-C
- Fra Filippo Lippi** *see* Lippi
- Fractional distillation**  
 coal tar, 9-445-47  
 petroleum, 9-\*452
- Fractions**, mathematics, 10-430

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Fractures** of bones, 2-321, 324  
 simple and compound, 2-408  
 treatment, 2-†406-8

**Fragonard, Jean-Honoré**, paintings by, 11-283, 286

**"Fram,"** Nansen's ship, 13-499  
 maps showing route of, 13-\*500

**France, Anatole, (Jacques Anatole Thibault),**  
 life and works, main article, 13-136-37  
 portrait, 13-\*136

**France, country, Europe, main article, 6-†164-**  
 202; general data, 6-202-B  
*see also* index World War II, 6-493  
 academies, *see* French academies  
 agriculture, 6-202-B  
 butter substitute awarded prize, 9-372  
 nut growing, 9-202  
 pears grown, 9-168  
 wheat production, 9-98  
 wine industry saved by Pasteur, 13-367

**architecture**  
 Francis I style, 11-486, †488  
 Gothic, 11-460, \*461, 465-66, 470  
 Renaissance, 11-486, †488-90, 491  
 Romanesque, 11-456  
 area, 6-202-B  
 arms and armor, 10-\*355

**art**  
 Carolingian, 11-85, 86, 88  
**Gothic Art**, 11-†93-101  
**modern painters; Impressionism**, 11-†337-  
 50, color plates, frontispiece, fol. \*360  
**modernists**, 11-†379-92  
**period of Louis XIV; Poussin and Claude**  
 in Italy, 11-†230-39  
**period preceding Revolution**, 11-†279-91  
 Chardin, 11-†283-86  
 David, 11-\*287, 289-90  
 sculpture, 11-\*290, 291  
 Watteau, 11-\*279, †280, 283  
**Romanticism**, 11-†322-35  
 Barbary Coast piracy ended by, 5-454  
 Bastille Day, 6-187  
 Breton sailors, 13-473  
 chalk cliffs, 3-14  
 Christmas customs, 14-589  
 cities and rivers, 10-254-56, 257  
 climate, 6-202-B  
 mistral (a wind), 1-231  
 Northern, lacking in sunlight, 11-462  
 colonization, *see* French in America  
 common people  
 burdens under Louis XIV, 6-182, 184  
 hungry mob besieges Versailles, Marie  
 Antoinette, 6-†188  
 Louis XVI; Bastille stormed, 6-191; *see*  
*also* French Revolution  
 "Revolution of Three Days," 6-198  
 modern citizens, 6-202  
 corruption attacked by Voltaire, 13-119  
 costume, modern, 9-\*9-11, 16  
 shoe fashions, 9-57

**France—continued**

crafts  
 bronze work, 12-22, 24, 107  
 carving, 12-\*101, \*105  
 enamel, 12-\*65  
 furniture, 12-\*188-89, †190, \*193  
 glass, 12-38  
 goldsmithery and silversmithery, 12-84, †86,  
 90  
 ironwork, 12-10  
 laces, 12-171  
 pottery, 12-\*54, \*55, 58, 59, 61  
 stained glass windows, 12-\*75, 77  
 tapestry weaving, 12-\*139, \*142, †143-44  
 drama and theater, 12-330-31, 332, 333, 334  
 exploration, *see* history *below*  
 farmer-generals, 13-381  
 flag, color plate, 14—following 570, no. 25  
 Franklin's mission to, 12-\*465, 466  
 Gaul ancient name for, 5-268  
 Golden Age, 12-412  
 government, 6-202-B; 7-354  
 history, 6-†164-202; 7-2-7  
 Greek colonization to 1589, 6-†164-77  
 Frankish kings, 5-†290-94  
 Merovingians, 6-167  
 Carolingians, 6-168  
 Capetians, 6-169  
 house of Valois, 6-170  
 Bourbons, 6-179  
 relations with Austria, 6-181, 186, 192,  
 194, 260  
 revolt of Sicily against, 6-208  
 becomes Scotland's ally, 6-116  
 Hundred Years' War, 6-†26-28, 35, 170,  
 174-76  
 Joan of Arc, 12-†386-90; *see also* Joan of  
 Arc  
 relations with Switzerland, 6-249, 250,  
 253  
**from 1589 to 1804**, 6-†179-94  
 Thirty Years' War, 6-214, 263  
 war with England and Holland, 6-\*353  
 War of the Spanish Succession, 6-75, 184,  
 219, 331  
 Seven Years' War, 6-221, 264; 12-418  
 in India, 5-381  
 farmers-general, 13-381  
 aids American colonies in Revolutionary  
 War, 12-450, 451, 455, 466, 467; 7-170  
 Revolution, 6-†187 fol.; *see also* French  
 Revolution  
 Constitution of 1791, 6-191  
 relations with U. S., 7-195, 198  
 first republic established, 6-194  
 efforts to wrest sea power from Spain,  
 10-169  
 Battle of Trafalgar, 10-171  
 eighteenth-century changes, 11-279  
**exploration and settlement in America**, 7-  
 2-7, †135-41; *see also* French in America  
 from Napoleon to the present, 6-†196-202

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**France, history, from Napoleon—continued**

- Napoleon's rule and wars, 12-†423-32  
*see also* Napoleon I, emperor of France;
- Napoleonic Wars
  - rule in Italian states, 6-306
- Bourbons restored to throne, 6-197
- Revolution of 1830, 6-198
- Louis Philippe called to throne, 6-198
- Revolution of 1848, 6-199
- ally of England in war with China, 5-332
- Second Empire, 6-199
- Crimean War, 6-436
- in Mexico, 7-85
- Franco-Prussian War, 6-200, \*216, 229;  
 12-448, 449
- Third Republic, 6-200
- Triple Entente, 6-438
- World War I, 6-201, 236
  - declares war against Germany (1939), 6-202
  - friendship with Poland, 6-454
- see also* Gaul, and names of sovereigns, as Louis XIV
- Huguenots, 6-\*174-75, †176-77; *see also* Huguenots
- industries, *see below* products and industries
- influence on English life, 6-20
- influence on Hungarian culture, 6-280
- Jefferson's mission to, 12-504
- Jews; doctrine of liberty applied to, 5-138
- language and literature, *see* French language; French literature
- Library, National, 10-560
- location, 6-202-B
- maps, 6-579, 580
  - on map of Europe, 6-570
- metric system, 10-†376-77
- military service period reduced, 6-202
  - ancient, showing races, 6-165
- music and musicians, 12-246, 253, †304, †307, †317
  - "Marseillaise," 12-242
  - opera, 12-225, 237, 253
  - troubadours and trouvères, 12-216
- name derived from Franks, 6-167
- New Year's Day, 14-\*578
- nickname for people, 8-206-A
- people, 6-202-B; 5-44
- physical features, 6-202-B
- possessions
  - Africa, 5-743-B
    - map, 5-\*444
  - Asia, list, 5-336-D
  - Indo-China, 5-429, 430
  - Madagascar, 5-464
  - Malay Peninsula, 5-427, 429
  - Mediterranean, 6-472
  - North American, 7-33-N
  - Pacific islands, 5-522, 526, 528
  - protectorate over Andorra, 6-468
  - South American, 5-518-B
  - West Indies, 7-51, 57, 63, 64
- products and industries

**France, products and industries—continued**

- canning, 9-228-29
- coal, 9-438
- cheese making, 9-348
- industries of important cities, 10-255-56
- peanut oil, 9-199
- perfume industry, 9-\*299, 302
- silk, 9-38
- wine, 10-256
- see also* agriculture *above*
- rivers, 10-254-56, 257; 6-202-B
- rule in Egypt, 5-72
- sports
  - fencing, 14-514
  - tennis, 14-466, 470
- Statue of Liberty a gift to America, 7-402
- styles for women set by, 9-20
- trade, 10-255
  - cargoes of tramp steamers, 10-233
  - China; privileges, 5-332
  - India
    - French East India Company, 5-379
    - losses to England, 5-382
  - Malay, 5-426
  - merchant marine, number of, 10-232
  - peanuts consumed, 9-199
  - tobacco buying, 9-223
  - treatment of Jews, 5-136
  - war debt, 7-340
- see also* entries preceded by French
- Francesca, Piero della, paintings, 11-\*139, 142
- Franchise, city contract, 7-399
- Francia, José Gaspar Rodríguez, Paraguayan tyrant, 5-509
- Francis, Saint, of Assisi, life, main article, 13-†528-30; 5-\*276, 277, 6-298
  - church over tomb of, at Assisi, 11-110, 119
  - church robe, 12-164
  - emblem, 13-534
  - influence upon art, 11-95, 109, 111
  - painting of death, 5-\*276
  - preaching to the birds, 11-\*116
- Francis I, Holy Roman emperor, 6-264
- Francis II, Holy Roman emperor (Francis I, emperor of Austria), reign in Austria, 6-267
  - returns bronze horses to Venice, 11-81
  - war with France, 6-192, 224
- Francis I, emperor of Austria, *see* Francis II, Holy Roman emperor
- Francis I, king of France, reign, 6-176
  - and Henry VIII, 6-\*44; 12-392
  - architecture fostered by, 11-486, 488, 490
  - Cellini saltcellar, 12-88
  - death in Chateau of Rambouillet, 11-\*490
  - defeat of Swiss at Marignano, 6-\*173
  - Louvre started by, 11-488
- Francis II, king of France, 6-176; 12-398
  - and Mary Queen of Scots, 12-398
- Francis II, duke of Brittany, tomb carvings, 11-\*92
- Francis I style of architecture, 11-486

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Francis Ferdinand**, archduke of Austria, assassination, 6-274, 363
- Francis Joseph**, emperor of Austria, 6-270, †286  
at Hungary's Millennial Diet, 6-286  
crowned king of Hungary, 6-271, 288  
portrait, 6-273
- Francis of Lorraine**, second duke of Guise, *see* Guise, Francis of Lorraine, second duke of
- Francis Xavier, Saint**, *see* Xavier, Francisco (Francis), Saint
- Franciscans**, religious order, 5-277; 13-529  
Junipero Serra, 8-36  
New Mexico, 8-258  
Roger Bacon a member, 13-376
- Francium**, element, 1-551
- Franck, César Auguste**, composer, 12-254  
and Debussy, 12-317  
Symphony in D major, 12-236
- Franco, Francisco**, Spanish dictator, 6-335
- Franco-Prussian War**, 1870, 6-200, 229; 12-449  
Bismarck's march to Paris, 6-216  
meeting of Bismarck and Napoleon III, 12-448  
scene from battlefields around Metz, 6-216
- Franconia Notch**, 8-242-A
- Franconia Range**, mountains, N. H., 8-242-A
- Frank, Stephen**, American pioneer, 8-133
- "**Frankenstein**," by Mary Shelley, 13-229
- Frankenstein, A. F.**, music by, 8-42-B
- Frankfort, Germany**, parliament at, attempts to unify Germany, 6-228
- Frankfort, Ky.**, 8-133  
industries, 8-138  
site of fort of Boonesborough, 12-472
- Frankfort, Peace of**, 6-200
- Frankincense**, 9-209
- Franklin, Benjamin**, character and achievements, main article, 12-†463 68  
at Constitutional Convention, 12-496  
befriended by Marie Antoinette, 8-307  
bust by Houdon, 11-284  
conference with Lord Howe, 12-479  
diplomatic service, 12-†466-68  
founds University of Pennsylvania, 12-465  
gives ship to John Paul Jones, 12-502  
historic documents signed by, 12-463, 468  
library association organized, 10-557  
mission to France, 12-465, †466-68; 7-170  
opinion of Constitution, 7-182  
"Poor Richard's Almanac," 12-464  
portraits, 5-43; 7-179; 12-464  
postal service organized by, 10-88  
printing, 12-463 fol.  
"Pennsylvania Gazette" and "Poor Richard's Almanac" issued by, 10-77  
printing house, 10-56  
interior, 10-77  
public library started in America, 12-467  
quoted, 14-585  
represents colonies in England, 12-†467; 7-158, 160, 166
- Franklin, Benjamin—continued**  
scientific contributions, 12-465  
lightning experiment, 1-493, 495; 14-500  
stove invented, 12-465; 10-381
- Franklin, Deborah Read** (Mrs. Benjamin Franklin), 12-463, 464
- Franklin, James**, 12-463
- Franklin, Sir John**, adventures, 13-496, 497
- Franklin, William**, 12-466
- Franklin**, provisional dist., Canada, map, 7-593
- Franklin, State of**, early name for Tennessee, 8-374
- "**Franklin D. Roosevelt**," aircraft carrier, 10-348
- Franklin Furnace**, N. J., town, zinc mines, 8-249
- Franklin stove**, 12-465; 10-381
- Franklin's gull**, bird, 4-203
- Franklin's rod**, (lightning rod), 12-465
- Franks**, Germanic tribe, kingdom of, 5-†290-94; 6-†166-69  
battle at Roncevaux, 14-337  
become masters of Gaul, 6-166  
Charlemagne rules, 5-†292-93; 6-168; 12-†369-70  
Charles Martel defeats Moors, 5-292; 6-167  
Clovis unites, 5-†290-91  
conquer Helvetia and Rhaetia, 6-246  
conquer other German tribes, 6-206  
descendants in France, 6-202-B  
France named after, 6-167  
migration, 5-264, 268  
system of counting, 10-423
- "**Franks, History of the**," by Gregory of Tours, 5-291
- Franz Josef Land**, archipelago, Arctic Ocean  
discovery, 13-500  
map, 13-502-A
- Franz Josef Glacier**, New Zealand, 5-541-B
- Fraser River**, British Columbia, Canada, 7-33-A  
length, 10-253  
map, 7-592
- Fraunces' Tavern**, New York, Washington's  
farewell to officers in, 12-477
- Fraunhofer, Joseph von**, scientific discoveries, 1-171, \*185
- Fraunhofer lines** of spectrum, 1-185, \*187
- Frazer River**, *see* Fraser River
- Freckles**, cause of, 1-200; 2-288
- Frederick I**, Barbarossa, Holy Roman emperor, reign, 5-293, 297  
and Pope Hadrian IV, 5-295  
wars in Italy, 6-†209, \*296, 297
- Frederick II**, Holy Roman emperor, reign, 5-200; 6-209  
friend of Haakon the Old, 6-386  
quarrel with pope, 6-298
- Frederick III**, Holy Roman emperor (Frederick IV, king of Germany), reign, 6-211  
and Austria, 6-260  
other titles, 6-210
- Frederick III**, German emperor, 6-233
- Frederick I**, king of Denmark, 6-413

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

- Frederick II**, king of Denmark, 6-413  
**Frederick III**, king of Denmark, 6-388, 414  
**Frederick IV**, king of Denmark, 6-388, 415  
**Frederick V**, king of Denmark, 6-388, 415  
**Frederick VI**, king of Denmark, 6-416  
**Frederick VII**, king of Denmark, constitution accepted by, 6-416  
**Frederick VIII**, king of Denmark, 6-416  
**Frederick I**, king of Prussia, 6-219  
**Frederick II**, the Great, king of Prussia, life, 12-†418-19  
     and partition of Poland, 6-222, 264, 451  
     and Voltaire, 6-\*220, 222; 13-\*117, 118  
     Carlyle's biography, 13-236  
     gives Catherine to Peter of Russia, 12-416  
     reign, 6-†220-23  
     Seven Years' War, 6-221, 264; 12-418  
**Frederick I**, king of Sweden, 6-405  
**Frederick III**, of Brandenburg, *see* Frederick I, king of Prussia  
**Frederick Augustus I**, king of Saxony, establishes pottery at Meissen, 12-60  
**Frederick William**, the Great Elector, founder of Prussian power, 6-†217 fol.  
**Frederick William I**, king of Prussia, 6-219  
**Frederick William II**, king of Prussia, 6-223-24  
**Frederick William III**, king of Prussia, 6-224, 227, 228  
     wife and sons, 6-\*222  
**Frederick William IV**, king of Prussia, 6-228  
     youth, 6-\*222  
**Frederick County**, Va., apple crop, 8-415  
**Fredericksburg**, Va., historical parks and monuments, 7-414; 8-418-A  
**Fredericksburg**, Battle of, 7-262  
**Fredericksburg and Spotsylvania National Military Park**, Va., monument, 7-\*413  
**Fredericton**, New Brunswick, 7-29-N  
**Frederigo**, duke of Urbino, portrait, 11-\*139, 143  
**Frederikshald**, Norway, siege, 6-405  
**Free City of Danzig**, 6-468  
**Free coinage of silver**, *see* Silver  
**Free lace**, 12-170  
**Free-soil controversies**, 7-247, 217, 236  
**Free trade party**, Calhoun head of, 12-456-F  
**Free verse**, 13-348  
     "Patterns," by Amy Lowell, 13-349  
     Walt Whitman first writer of, 13-327  
**Free wheeling** of automobile, 10-291  
**Freedmen** (Negroes), during Reconstruction, 7-†268-74  
**Freedom**  
     growth of idea in Russia, 6-435 fol.  
     repression under dictatorships, 7-555  
     Russia; suppression of, 6-443  
     struggle for, 5-299  
     suppressed by Communists, 6-439 fol.  
     suppressed by Fascists, 6-314, 315  
     suppressed by Nazis, 6-240  
     *see also* Freedom of speech; Freedom of the press; Religious freedom  
**"Freedom and Unity"**, state motto of Vermont, 8-404  
**Freedom of speech**  
     curbed by Criminal Syndicalism Laws, 7-334  
     granted in U. S. Constitution, 7-368  
     Mexico, 7-84  
     Milton's "Areopagitica," 13-168  
     Russia; suppression, 6-443  
     suppressed by Nazis, 6-240  
     won during Modern Age, 5-284  
**Freedom of the press**, 7-368  
     Russia; suppression, 6-443  
     suppressed by Nazis, 13-1  
**"Freedom of the Will, The,"** by Jonathan Edwards, 13-292  
**"Freeman's Oath, The,"** printed in colonial America, 10-56  
**Freemasonry**, origin, 11-468  
**Freestone State**, nickname for Connecticut, 8-62  
**Freetown**, Sierra Leone, founded for freed slaves, 5-470  
**Freezing**  
     causes water to expand, 1-483  
     effect on germination, 2-217  
     heat energy released in process of, 1-407  
     quick-freezing process, 10-519  
     treatment for frostbite, 2-404  
     *see also* Frost; Ice; Refrigeration; Refrigerators  
**Freezing point**, on thermometers, 1-208  
**Freezing points**, 1-\*392  
**Freie Bühne**, Berlin theater, 12-333  
**Freight terminals**, New York City, 10-\*198  
**Freight wagons**, 10-†146, 148  
**"Freischütz, Der,"** opera by Weber, use of clarinet and French horn in, 12-258 B  
**Frémont, John Charles**  
     and conquest of California, 8-37  
     nomination for president, 7-250  
**French, Daniel Chester**, 11-364  
     sculptures  
         "Death Staving the Hand of the Sculptor" by, 1-\*51  
         "Lincoln," 11-\*360, 364  
         "Memory," 11-\*360  
         "Mourning Victory," 11-\*360  
         statue of "Minuteman," 7-\*160  
**French academies of art**, 11-232, 239, *see also* Royal Academy, France  
**French Academy in Rome**, founded, 11-239  
**French and Indian War**, 7-8, 143  
     Allegheny region, 8-432  
     beginning of struggle, 7-8, 143  
     called Seven Years' War in Europe, 6-80  
     defeat of Braddock's forces, 7-\*141, 143  
     events leading up to, 7-7  
     first shot fired in America, 7-143; 12-474  
     New York, 8-276  
     scene showing General Wolfe on the Heights of Abraham, 7-\*142  
     scene during General Abercrombie's expedition, 6-\*79

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**French and Indian War**—*continued*

Washington's part in, 12-474

*see also* Seven Years' War**French architecture**, *see* France, architecture**French art**, *see* France, art**French Broad River**, N. C. and Tenn

North Carolina, 8-296

Tennessee, 8-373

**French bulldogs**, 4-495**French Cameroons**, *see* Cameroons**French Canadians**, 7-143

given an equal part in government, 7-14

loyalty to Canada during American invasion, 7-12

occupations, land ownership, 7-11

outdoor ovens used by, 9-238

sympathy for Métis rebels, 7-26

under British rule, 7-11-20

*see also* Canada, history; French in America**French crafts**, *see* France, crafts**French East India Company**, 5-379**French Equatorial Africa**, 5-470

map, 5-576

**French furniture**, 12-188-89, 4190, 4193**French Guiana**, colony, So. Amer., 5-500, 512

map, 5-603

*see also* Guiana**French Guinea**, colony, Africa, 5-473

map, 5-574

**French horn**, musical instrument, 12-258 B**French in America, exploration and colonization**, main articles, 7-52 7, 4135 43

Acadians deported by English, 7 8

Arkansas claimed for, 8-28

Connecticut territory, 8-399

"coureurs de bois," 7-6

Daniel Greysolon in Minnesota, 8-191

descendants, 7-143

extent of French Empire, 7-4139

Louisiana Purchase, 7 4206 7

map, 7-4206

map showing territory won and lost, 7-139

Treaty of Paris, 1763, lands lost, 7-143

Treaty of Utrecht, 1713, lands lost, 7-7

Florida, 8-69

fur trade, 7-5, 6, 7

Huguenots, 8-349

Indiana, 8-111

La Salle in Texas region, 8-377

loss of American possessions, 7-7, 8, 143

Louisiana, 8-4142

law influenced by, 8-146-A

Maine coast, 8-152

Michigan, 8-181

Mississippi, 8-201

motives for going to New World, 7-2, 137

Ohio, 8-305

population sparse, 7-5, 140

relations with Indians, 7-2, 5, 6, 4136, 137

enmity of Iroquois, 8-271

French and Indian wars, 7-7, 8, 142, 143;

*see also* French and Indian War**French in America, relations**—*continued*

friendship, 7-140

Frontenac avenges massacre, 7-6

fur traders and, 7-6

guided and taught canoe travel, 7-2, 3, 136

Iroquois become enemies, 7-5, 4136

missionaries to, 7-137, 139

treatment of settlers, 7-140

voyageurs, 7-4, 137

Wisconsin, 8-440

*see also* French Canadians; *also* names of French explorers, *as* La Salle, René**French Indo-China**, Asia, description, 5-429-30,

general data, 5-430-B

independence, 6-562

maps, 5-588, 581

products, 5-430-B

**French language**

derivation, 10-5

influence upon English, 10-11, 18

official language of Belgium, 6-346

**French literature**

beginnings of, 6-169

biographies, 13-4103 37

Balzac, 13-4127-28

Beaumarchais, 13-121

Boileau, 13-4114

Corneille, 13-109-10

Daudet, 13-133

De Staël, 13-122

Diderot, 13-119-20

Dumas, 13-4128-29

Flaubert, 13-132

France, Anatole, 13-136-37

Froissart, 13-4103-4

Hugo, Victor, 13-125-26

La Fontaine, 13-115 16

Lamartine, 13-123

Le Sage, 13-116

Maupassant, 13-134

Mérimée, 13-131

Molière, 13-4110-12

Montaigne, 13-106-7

Musset, 13-124

Pascal, 13-4108-9

Rabelais, 13-105-6

Racine, 13-112-13

Ronsard, 13-107

Rostand, 13-137

Sand, George, 13-130

Villon, 13-4104-5

Voltaire, 13-4117 19

Zola, 13-135

*see also* under names of writers in index, *as*

Dumas; Mérimée

drama, 12-330-31, 332, 333; 13-4109-13

"Encyclopedia," 13-120

essay invented, 13-106

Louis XIV's literary circle, 6-185; 12-412; 13-4114

naturalism, 13-134, 135

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**French literature—continued**

- "Reynard the Fox," 6-169  
 retold, 14-†323-28  
 story of Roland retold, 14-†337-42
- French Revolution**, 6-187 fol., †191-94  
 American sympathy, 7-195  
 attitude of England, 6-86  
 Bastille taken, 6-187, 191  
 Burke's feeling toward, 13-201  
 Carlyle's history, 13-236  
 causes, 6-186, 188, 190  
 clergy opposed, 6-192  
 Committee of Public Safety, 6-194  
 Declaration of the Rights of Man, 6-191  
 Directory, 6-194  
 effect on Danish liberty, 6-416  
 effect on Norway, 6-388  
 Estates General meets, 6-187, 188  
 Girondists and Jacobins, 6-192-93  
 influence upon art, 11-288  
 influence upon Portugal, 6-342  
 Lafayette and, 6-191; 12-451  
 Lavoisier, 13-381  
 Marie Antoinette, 6-188, †191  
 "Marseillaise," 12-†242; 6-193  
 Napoleon's part in, 12-424  
 Reign of Terror, 6-193-94  
 Sheridan's sympathy for, 13-206  
 significance, 7-354  
 taxation a cause of, 13-380  
 Wordsworth's sympathies, 13-215  
 XYZ affair with United States, 7-198
- French seam**, 14-†72
- French Somaliland**, Africa, map, 5-579
- French Sudan**, colony, Africa, 5-473
- French telephone**, 1-†518
- French Union**, 5-430-B
- French West Africa**, map, 5-574
- Frenchman's Bay**, graves along shore, 8-149
- "Frenzied Fiction,"** by Leacock, 13-580
- Freon-12**, gas, 1-410; 10-516, 518
- Frequency**, physics, 1-418; light waves, 1-418  
 radio, 10-115, 121-J
- Frequency Modulation**, in radio, 10-121-U-V
- Frère, Charles**, painting, 5-†58
- Fresco painting**, 11-114  
 Cretan style, 11-†33  
 Michelangelo, 11-†157, †158, 162  
 Raphael, 11-167, 168
- Fresh water, animal life in**, main article, 3-†222-24  
**fishes**, 3-224, †226-33, †235-42; 9-368  
 largest fresh-water fishing industry, 8-311  
   **migratory**, 3-†244-52  
**insects**, 3-360, †363, 384, †386-94, †396-404  
**shellfish**, 3-†254-62  
*see also classes of animals found in fresh water,*  
*as Alligators; Turtles, and also names of*  
*creatures, as Clams; Otters; Trout*
- Frets**, of banjo, 12-258-C
- Freud, Sigmund**, theories studied by writers, 13-350, 351
- Frey, Agnes**, wife of Albrecht Dürer, 11-208
- Freya**, goddess, 6-370, 377
- Freyberg, Sir Bernard**, 5-541-A
- Friant Dam**, California, 8-43
- Friars**, religious orders, 5-277; 13-529  
 Bridge-building Friars, 10-151, 213  
*see also names of orders, as Franciscans*
- Fricker, Edith** (Mrs. Robert Southey), 13-219, 220
- Fricker, Mary**, 13-219
- Friction**, physics, main article, 1-†315-21  
 advantages and disadvantages, 1-319-21  
 brakes made possible by, 10-291  
 generates heat, 1-320, †382  
 makes perpetual motion impossible, 1-317, 318  
 oil reduces, 1-320  
 rolling and sliding, 1-†319, 321
- Friday**, character in "Robinson Crusoe," 13-177
- Friday**, origin of name, 10-483; 6-205, 377
- Friedland, Battle of**  
 Napoleon at, 12-†427, 430  
 painting by Meissonier, 11-†339, 340
- Friedrichsruh**, estate of Bismarck, 12-449
- Friendly (Tonga) Islands**, Pacific Ocean, 5-528, †529  
 map, 5-572
- Friends, Society of**, *see* Quakers
- "Friendship,"** motto of Texas, 8-386-A
- Friesland**, province, Holland, 6-353  
 headdress, 6-†352  
 map, 6-592
- Frieze**, architecture, 11-†418, 420, 421  
 Parthenon, Athens, most famous in world, 11-45, †422  
 Roman, 12-†94
- Frigate**, warship, 7-202, †210, 481
- Frigate bird**, 4-214, †215
- Frigid zone**, 1-204
- Frilled lizard**, 3-451
- Frisian Islands**, North Sea, map, 6-582
- Frit**, use in porcelain, 12-59
- Fritsch, Doctor**, studies of the brain, 2-385, 388
- Frobisher, Martin**, voyages, 6-57; 13-496
- Frog, amphibian**, main article, 3-†415-26  
 blood corpuscles, 2-†346  
 Carboniferous period, 3-29  
 compared with toad, 3-416, 421  
 croaking, 3-420, 422  
 eggs and hatching, 3-†417 20, †424-26, †222  
 in woodland pool, 3-†222  
 largest and smallest, 3-422  
 scale drawing, 14-†64  
 skin; molting, 3-416  
 tree frog (tree toad), 3-†418, †420, †423-25
- Frogfish**, 3-207
- Frog hopper**, *see* Spittle insect
- Frogmouth**, bird, 4-†177
- "Frogs, The,"** by Aristophanes, 13-39, 40
- Frogspit**, pond scum, 2-68
- Froissart, Jean**, life and works, 13-†103-4
- "From the New World,"** symphony by Anton Dvořák, 12-256, 310

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- "Fromont the Younger and Risler the Elder,"  
by Daudet, 13-133
- Fronde, the, political party of France, 6-181
- Fronds of fern, 2-†87 fol.
- Front Range of Rockies, 8-52-A, 454
- Frontenac, Louis de Buade, Count of, governor  
of Canada, 7-6
- aids explorers, 13-483, 486
- Frontier, American, 7-†277-81; *see also* Pioneers;  
West, the
- Frost, Robert, poet, 13-349
- background of period, 7-335
- poet of Revival, 13-348
- Frost, 1-240, 237, \*251
- action in producing soil, 1-41
- protection of fruit trees from, 1-237; 9-163, 174
- under microscope, 10-\*487
- Frostbite, treatment for, 2-404
- Frosted foods, 10-519
- Frozen, wages and prices, 7-508
- Fruit, botany, main article, 2-†118-22
- berries, 2-120, 121
- corn, 2-\*126
- drupes or stone fruits, 2-120, 121-22
- ovary becomes, 2-104, 121
- see also* Fruits and fruit growing
- Fruit basket, game, 14-155
- Fruit bats, 4-\*271, 275, \*276
- Fruitlands, Alcott's community, 13-320
- Fruits and fruit growing
- apples, 2-115-16
- bananas, 9-†180-83
- berries, 9-†156-59
- breeding, 2-232
- Burbank's work, 13-416, 417
- canning, 9-\*226, \*230, 231
- cantaloupes, 9-\*152
- citrus fruits, 9-†170-75
- classification, 2-†118-22
- cranberries, 9-\*157
- dried, 9-\*229
- "fruit tramps," 8-41
- fruits eaten as vegetables, 2-256
- grafting, 2-†231
- how to make animals from fruits, 14-†13, †14
- largest and smallest, 2-250
- orchard fruits, 9-†161-68
- orchards: modern care, 9-†163-64
- frost protection, 9-174
- perfume a by-product, 9-301
- pineapples, 9-†185-86
- protection from frost, 1-237; 9-163, 174
- refrigeration prevents spoiling, 10-516
- relation to seeds, 2-†118, 119
- scattered by wind, 2-†210-12
- tropical fruits, 9-†193-96
- United States, 7-343-E; 9-162
- Delaware, 8-66
- Florida, 8-74
- New York, 8-279
- Oregon, 8-329
- Wisconsin, 8-444
- Fry, of salmon, 3-\*247
- Fry, Elizabeth, prison work and prison reforms,  
6-†85
- Frying Pan Flat Geyser, New Zealand, 1-\*36
- Fu Hsi, Chinese ruler, 5-314
- discovers iron, 12-1
- Fucus, alga, 2-\*66
- "Fuehrer, Der," 6-\*240
- Fuel, 1-386
- body, 2-360 fol.
- chemical analysis, 10-548,
- exhaustion of supply, 1-\*349, 352
- for central heating furnaces, 10-384
- Ireland, 6-161
- manufactured by chemist, 10-547
- result of sunshine, 1-386
- supplies energy for turbines, 1-508
- wood used for, 8-407
- see also* entries under Coal and coal mines;  
Oil; Wood
- Fuel Administration, 7-332
- Fuel injector, Diesel engine, 10-\*276
- Fuel oil, 9-455
- Fugger, Anton, entertains Charles V, 6-\*212
- Fugitive slave laws, 7-247
- Fugue, music, 12-230
- Fuji, Fujiyama, or Fuji-no-Yama, or Fujisan,  
volcanic peak, Japan, 5-345, 364-B, \*364-A
- Fujiwara, Japanese family, 5-348
- Fulcrum of lever, 1-†324, \*326
- "Full dinner pail," Republican slogan, 7-302
- Full moon, 1-\*124, 126
- Fullback in football, 14-516
- Fuller, Margaret, 13-305
- Fuller's earth, 8-74
- Fulton, Robert, *litc.*, 10-220
- "Clermont" and other steamboats operated  
by, 10-\*217-18, 221
- perpetual motion machine hoax exposed by,  
1-318
- plan of submarine presented to Napoleon, 10-  
†308
- Fulton County, Kentucky, elevation, 8-138-A
- Fulton River, Montana, 8-220
- Fulton Street Fish Market, 9-\*370
- "Fulton's Folly," steamboat, 10-217, 218
- Functionalism, in architecture, 11-524
- Fundamental Constitutions, 8-350
- Fundamental Orders, 8-56, 62
- Fundy, Bay of, tides, 1-134, 137
- Funen, island, Baltic Sea, map, 6-599
- "Funeral, The," by Sir Richard Steele, 13-180
- Funeral, viking, 6-†376
- Funeral boats
- Egyptian, 5-\*60; 11-\*13
- Venetian barge, 11-\*487
- Funeral customs, *see* Burial of dead
- Funeral Range, Calif., 7-\*416
- Fungi, main article, 2-†71-76
- alternate hosts, 2-141
- beneficial and destructive, 2-76
- enzymes secreted by, 2-53

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Fungi**—*continued*

- fermentation caused by, 2-19
- in lichens, 2-58, 70
- luminescence, 2-72
- molds, 2-†74-76
- parasitic and saprophytic, 2-†55, †57, 74
- plant diseases caused by, 2-136, 141; 9-100
- rusts caused by, 2-†140; 9-100
- spores, 2-71, 76
- symbiosis, 2-†58
- see also* Bacteria

**Fungicides**, 2-130**Funniest characters in literature**, 13-77**Fur**, use of, in hat manufacture, 9-†89**Fur-bearing animals**, *see* Animals, fur-bearing**Fur seals**, 4-†327-32**Fur trade**

- Alaska, 8-11
- Canada, 7-6, 19; 10-138
- Dakotas, 8-359
- Dutch, 8-272
- Green Bay, 8-440
- Idaho, 8-88
- La Salle tries to establish, 8-96
- Michigan, 8-181
- Montana, 8-217
- Ohio, 8-305
- Oregon, 8-326
- Siberia, 6-428
- trading post, 7-†140
- United States, 7-231

**Furies** (Erinyes), mythology 14-455**Furlong**, unit of measure, 10-375**Furnace**, heating by, 10-†381-85

- blast, 9-†400 fol.
- chrome brick lining, 9-420
- coal, chemical process, 1-†556

**Furniture**, main article, 12-†174-99

- doll, how to make, 14-†31
- earliest, 12-†176-81, 192
- first book of designs, 12-194
- industry, U. S., 7-343-F
- Michigan, 8-184
- styles
  - Adam, 12-†191-92, 194
  - American, 12-174, †195-99

**Furniture**, styles—*continued*

- bouffe work, 12-190
  - Byzantine, 12-†181
  - Chinese, 12-†187, 192, 194
  - Chippendale, 12-†191, 194
    - copied by Savery, 12-198
  - church, 12-†181-84
  - Directoire, 12-192
  - Duncan Phyfe, 12-†197, 198
  - Early American, 12-†196-98
  - Egyptian, 12-102, 176, \*177
  - Empire, 12-†189, 192
  - English, 12-†182 fol
  - Etruscan, 12-†180
  - French, 12-†188-89, †190, \*193
  - Gothic, 12-182, 184
  - Greek, 12-178 70
  - Hepplewhite, 12-†191, 194, \*197
  - Italian, 12-†181, \*183, 186
  - Jacobean, 12-188
  - Louis Quatorze, 12-†189, †190
  - Louis Quinze, 12-†189, 190
  - Louis Seize, 12-†189, 190
  - medieval, 12-†181-82, †184-85
  - modernist, 12-†174, \*175, †199
  - Queen Anne, 12-192
    - imitated by Goddard, 12-198
  - Renaissance, 12-†183 185, \*187 88
  - rocking chair, 12-198
  - rococo, 12-190
  - Roman, 12-†178, †179 81, 192
  - Romanesque, 12-182
  - Sheraton, 12-†191, \*195, 196, \*197
  - William and Mary, 12-†191, 192
  - Windsor chair, 12-198
  - styles that resemble architecture, 12-†183, 186, \*192
  - woods used for, 12-179, 182 fol; 9-258
- "Further Poems,"** by Emily Dickinson, 13-323
- Fuse**, electric, construction and operation, 1-524
- prevents fire, 1-†384
- Fuselage**, of airplane, 10-†328-K
- Fusing points**, *see* Melting points
- Fust**, Johann, printer, 10-48, 50
- Fynn**, Arthur J., song by, 8-52-B



**"G-men,"** government investigators, 7-378

**Gade**, Niels Wilhelm, 12-303

**Gadfly**, 3-†274, †360

**Gadha**, donkey, 4-†509

**Gadolinium**, element, symbol, atomic no. and wt., 1-†551

**Gadsden Purchase**, 12-456-1; map, 7-†206

**Gaelic language**, Scotland, 6-111, 124

Hebrides, 6-488; Ireland, 6-161

**Gaets**, people, in Beowulf legend, 14-319

**Gag resolutions**, 12-456-B

**Gagnon**, Clarence, Canadian artist, 7-29 1

"Canadian Woodsmen," 13-†582

"Street Scene, Quebec," color plate, 7-†29-1

**Gaheris**, Sir, character in Arthurian romances, 14-400

**Gaikas**, tribe, South Africa, 5-485

**Gaillard Cut**, Panama, 10-†272, 273

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Gainsborough, Thomas**, life and art, 11-†299-304  
paintings

Duchess of Devonshire, 11-∗301

Miss Havertield, 11-∗301

Mrs. Siddons, 11-∗301

"The Bailie Family," 11-∗299

"The Blue Boy," 11-∗301

rivalry between Reynolds and, 11-302

skill as landscape painter, 11-299, 304

**Gaiseric**, king of the Vandals, Rome sacked by, 5-262

**Galagos**, lemurs, 4-∗262, 269

**Galahad**, Sir, 14-∗395

at King Arthur's court, 14-†396, 398

**Galapagos Islands**, Pacific Ocean  
animal life

birds

albatross, 4-∗215

penguin, 4-210, ∗220

sea iguana, 3-452

area, 5-518-19

**Galatea** and **Pygmalion**, in Greek mythology, 14-453

**Galatea crab** (squat lobsters), 3-∗174

**Galatz**, Roumania, port on Danube, 10-259  
map, 6-504

**Galaxy**, 1-175; *see also* Milky Way

**Galdhoppigen**, peak, Norway, 1-29

**Gale**, Professor, partner of Samuel Morse, 10-96

**Gale**, Zona, "Miss Lulu Bett" by, 13-350

**Galen**, Claudius, Greek physician, 13-†358-59  
theory about lungs, 2-333

**Galena**, Ill., lead mines, 8-99

**Galena**, mineral

in silver ore, 9-389

lead found in, 9-418

**Galerius**, Roman emperor, ends persecutions of Christians, main article, 5-275

**Galilee**, Roman province in Palestine, 5-133

rabbis flee to, 5-133

**Galileo** (**Galilei Galileo**), life, main article, 13-†396-98

astronomical discoveries, 1-127, 148, 155, 156

attempt to measure speed of light, 1-417

Copernican theory, 13-397

falling bodies

discovers laws of, 1-†294-97

experiments with, 13-397, ∗398

Kepler and, 1-288, 290

law of pendulum discovered by, 10-∗463, 464;  
1-290, 292; 13-396

penalized for scientific views, 1-100, ∗102

portrait, 13-∗397

proving theories at trial, 1-∗294

telescope perfected by, 1-103

thermometer invented by, 1-207, ∗389, 390, 391

**Gall**, Franz Joseph, study of brain; phrenology, 2-383, 390

**Gall**, plant, *see* Galls

**Gall bladder**, 2-∗335, ∗362

color plate, 2-∗279

**Gall fly**, oak apple of, 3-∗274

**Galla Placidia**, Roman princess, captured by Goths; influence in Ravenna; tomb, 11-80

**Gallatin**, Albert, 12-560

**Gallatin National Forest**, Montana, 10-∗409

**Gallatin River**, Montana, 8-220

**Gallaudet glider**, 10-∗316

**Gallé**, Emile, glass decoration, 4-464

**Galle**, F. G., discovery of Neptune, 1-158

**Galley**, in printing, 10-60

**Galley slaves**, 10-164, ∗351, 352

**Galleys**, ships

Greek and Roman, 10-∗162, 163, †351

in Punic Wars, 5-∗211, 212, 213

iron used for, 12-4

suffering of oarsmen; dangers on, 10-164

viking, 6-∗371 fol., 10-∗163; 13-∗495

**Gallipoli campaign**, World War I, 5-414, 560

Churchill's part in, 12-449-C

**Gallium**, element, symbol, atomic no. and wt., 1-∗551

**Gallon**, measure, 10-375

**Galls**, plant, ink made from oak galls, 9-∗304, 307

**Gallup**, New Mexico, Inter-Tribal Indian Ceremonial held at, 8-261, 262-B

**Galt**, Edith Bolling (Mrs. Woodrow Wilson), 12-564

**Galvani**, Luigi, 1-495, 496

**Galvanizing iron**, 9-420

**Galvanometer**, mirror, 13-391

**Galveston**, Tex.

captured during Civil War, 8-381

hurricane disaster, sea wall, 1-72

industries, 8-385

temperature, 8-386

transit port, 10-247

view, 8-∗381

**Gama**, Vasco da, main article, 13-†460-61  
immortalized in verse of Camoëns, 13-81

**Gambel's sparrows**, 4-136

**Gambia**, colony, Africa, 5-471

map, 5-574

**Gambia River**, W. Africa, French Senegal and British Gambia into Atlantic at Bathurst  
length, 10-253

map, 5-574

**Gambling**

at Monte Carlo, 6-467

on stock exchange, 7-585

**Game birds**, *see* Birds

**Game of Kings** (tennis), 14-465

**Game Lodge**, 8-364-A

**Game protection**, *see* Conservation, wild life

**Games**, *see* Contents Volume 14

good practice for counting, 10-429

Olympic, 5-143, 154, 167; 14-471, 475

pleasant exercise, 2-415

*see also* Sports and games

**Gamma rays**, 1-419; 9-246; 10-494

**Gamopetalae**, plant division, main article, 2-†170-75

compositae, 2-∗170, ∗173-74, 175

**Gander**, New foundland airfield, 7-33

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Gandhi, Mohandas Karamchand** (the Mahatma)  
 biography, 6-506; portrait, 6-548  
 leadership in India, 5-387; 6-106  
 protest against treatment of British Indians  
 in South Africa, 5-490
- Ganelon**, in legend of Roland, 14-338
- Ganges River**, sacred river of India, rising in  
 Himalaya Mts., 5-\*370, \*385  
 basin area, 10-257  
 delta, 5-387-A  
 length, 10-253  
 map, 5-586  
 outlet, 5-387-A  
 worship of, 10-253
- Ganglion**, nerve center, 2-\*394-96
- Gangrene**, avoided by use of antiseptics, 13-372
- Gannet Peak**, Rocky Mts., 8-449
- Gannets**, birds, 4-†213-14, \*11  
 Oligocene period, 3-53
- Ganymede**, cupbearer to the gods, 14-430  
 sculpture by Benvenuto Cellini, 11-\*169
- Gap, water, see** Water gap
- Garand Rifle**, 10-368-E
- Garbage disposal**, 7-400; 10-549
- Garber pear**, 2-223
- Garden bench**, how to make, 14-†50
- Garden Club of Virginia**, 8-418-A
- Garden of Central America** (Costa Rica), 7-48
- Garden of Eden**, 5-119
- "Garden of Paradise, The,"** painting, 11-\*205
- Garden of the Gods**, Colorado, 1-\*39
- Garden of the West**, states nicknamed  
 Illinois, 8-106-A  
 Kansas, 8-132
- Garden Spider**, 3-408, \*409  
 egg sac, 3-\*410
- Garden State**, nickname for New Jersey, 8-252-A
- Garden Toad**, 3-\*416
- Garden truck**, vegetables, 9-150
- Gardener bower bird**, 4-186
- Gardening, soilless, see** Soilless gardening
- Gardening, truck, see** Truck gardening
- Gardening, vegetable**, 9-†147-54
- Gardens**  
 Japanese, 5-339, \*345, 351  
 made by bower birds, 4-†186  
 Versailles, 11-489, 491
- "Gardens in the Rain,"** by Debussy, 12-253
- Gardiner's Island**, Long Island, N. Y., bird  
 colony, 4-157
- Gardner, Mass., manufactures**, 8-174
- Garefowl** (great auk), bird, 4-†205
- Gareth, Sir**, in Arthurian romances, 14-†387-92,  
 400
- Garfield, James Abram**, president of the United  
 States, election, 12-456-C; 7-286
- Garfield, Lucretia Rudolph** (Mrs. James A.  
 Garfield), 12-563  
 gown worn by, 9-\*15
- Garfish**, 3-240, \*241
- Gargantua**, character by Rabelais, 13-106
- Gargoyles**, carvings, 11-†98-99, †470
- Garibaldi, Anita**, wife of Giuseppe Garibaldi,  
 12-445
- Garibaldi, Giuseppe, life**, main article, 12-†444-  
 46  
 and Victor Emmanuel II, 12-†446  
 fight for Italian independence, 6-307 fol.; 12-  
 445  
 in South America, 12-445  
 portrait, 12-\*445
- Garibaldi Park**, Canada, skiing, 2-\*417
- Garland, Hamlin**, author, 13-346
- "Garland of Fruits, The,"** painting, 11-\*217
- Garneau, François-Xavier, biography**, 13-  
 †575-76; portrait, 13-575
- Garner, John N.**, vice president of the United  
 States, 12-456-F
- Garnet**, precious stone, color plate, 9-frontis-  
 piece
- Garonne basin**, Europe, climate, 6-202-B
- Garonne River**, France, map, 6-580  
 length, 10-253
- Garret More** (Gerald the Great, earl of Kil-  
 dare), 6-149, 152
- Garret Oge** (Gerald the Younger, earl of Kil-  
 dare), 6-152
- Garrett, Elizabeth**, song by, 8-262-A
- Garrick, David**, 12-332  
 friend of Dr. Johnson, 13-†194, 195  
 Hogarth's portrait of, 11-296  
 opinion of Goldsmith, 13-199
- Garriot, Edward**, "Weather Folklore" written  
 by, 1-268
- Garrison, Lindley M.**, portrait, 12-\*549
- Garrison, William Lloyd**  
 and Whittier, 13-306, 307  
 zeal for abolition, 7-246
- Garter snake**, 3-498
- Gas**, chemistry and physics, *see* Gases
- Gas, illuminating**, 10-390  
 acetylene, 10-392  
 asphyxiation from, treatment, 2-410  
 by-products, 10-\*391  
 for heating, 10-384  
 given off by coal, 1-\*534  
 manufacture, 7-399; 9-444; 10-390, \*391  
 municipal supply, 7-399  
 used in aircraft, 10-314, 315, \*319
- Gas jet**, 10-†390
- Gas lamps**, in lighthouses, 10-228
- Gas mantle**, 10-†390
- Gas masks**, 7-\*322
- Gas, natural**, 9-449, 456  
 Montana's production, 8-218  
 Oklahoma, 8-319  
 plastics made from, 8-\*383  
 produced from coal, 9-444  
 Texas, 8-383  
 West Virginia, 8-435
- Gas pipes**, 7-399
- Gas plant**, herb, pollination, 2-109
- Gas plants**, equipment and operation, 10-\*391

The asterisk (\*), refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Gas, poison**, 2-339  
   of bombardier beetle, 3-†337  
   use in war, 6-104,  
**Gas refrigerator**, 1-†409, 410, 477  
**Gas, tear**, 10-364  
**Gas throttle**, automobile, 10-\*283  
**Gas warfare**, 6-104  
**Gasconade River**, Mo., Missouri River tributary, 8-212-A  
**Gases**, chemistry and physics, 1-403 fol.  
   arrangement of molecules in, 1-\*403, 404  
   atmosphere contains, 1-219, †373-77, 537  
   balloons' use, 1-473  
   Boyle's Law, 1-463  
   colored lights produced by, 10-392  
   compared to solids and liquids, 1-535  
   compared with liquid, 1-537  
   condensation, 1-406  
   conduction of sound, 1-447  
   contraction and expansion, 1-483  
   defined, 1-404  
   exchange of, in tissues and lungs, 2-339  
   explosions caused by expansion of, 10-415  
   Law of Archimedes, 1-470  
   liquefaction, 1-†405  
   molecular to cement in, 1-354  
   noble, 1-376, 547  
   of heavenly bodies, 1-14 9, 109, 110, 113, 170  
   perfect gas, 1-547  
   relation of volume to temperature, 1-483  
   used to extinguish fires, 1-385  
   water composed of two, 1-11  
*see also names of gases, as* Carbon dioxide, Helium, Oxygen  
**Gasoline**  
   boiling point, 1-\*392  
   chemist's improvements, 10-548  
   from petroleum, 9-456  
   high octane, 9-456  
   how fed into automobile cylinders, 10-†283 84  
   possesses energy, 1-340  
   specific gravity, 1-474  
   used by automobile, 2-†441  
     amount regulated by speed, chart, 2-441  
**Gasoline cars**, earliest, 10-†278  
**Gasoline taxes**, 7-389  
**Gaspé, Cape**, Canada, claimed for France, 13-\*473, 474  
**"Gaspee,"** British ship, 8-344  
**Gaston, William**, North Carolina's state song written by, 8-296-A  
**Gastric juice**, nature and function of, 2-356  
   acidity, 2-357  
**Gastrin**, hormone, 2-357  
**Gate City of the South (Atlanta)**, 8-78  
**Gate of the Lions**, Mycenae, 5-\*20  
   Egyptian pylons, 11-\*412, 413  
**Gates**  
   iron, 12-4  
   oriental, 11-\*394, \*401  
**"Gates of Paradise,"** carving by Ghiberti, 11-\*127  
**Gattamelata**, statue of, by Donatello, 11-\*129, 130, 137  
**Gatty, Harold**, aviator, portrait, 10-\*327  
**Gatun Lake and Dam**, Panama, 10-272; map, 10-273  
**Gatun Locks**, Panama Canal, 10-270, \*271; 7-\*306  
   night scene, 7-\*46  
**Gauge**, carpenter's, how to use, 14-†24  
**Gauguin, Paul**, paintings, 11-†386  
   portrait of a Tahitian, 11-\*386  
**Gaul**, ancient name for France, 5-268  
   conquered by Julius Caesar, 5-223; 12-357  
   made part of Roman empire, 6-165  
   overrun by Germanic tribes, 6-166  
   raided by Cimbri and Teutons, 6-244  
   system of signals, 10-29  
*see also* France  
**Gauls**, people  
   conquest of Rome, 5-\*202, \*203, 205  
   costume, 9-16  
   in France, 6-165, 166  
   in Hannibal's army, 12-\*354, 355  
   learn pottery making, 12-54  
   metal work, 12-4, 6, 84  
   migrations; civilization, 5-267  
**Gaur** (Indian bison), 4-394, \*395, †396  
**Gauss, Professor**, experiments with telegraph, 10-95  
**Gautama**, *see* Buddha  
**Gautier, Theophile**, 11-326, 327, 338  
**Gavial crocodile**, 3-\*437, 441  
**Gawain**, Sir, in Arthurian romances, 14-397, 400  
**Gay, John**, 13-184  
**Gay goshawk**, bird, 4-154  
**Gayal**, domesticated, 4-\*394  
**Gayandotte River**, U. S., 8-436-A  
**Gazelle**, animal, 4-418  
**Gazelle hound** (Saluki), 4-\*490  
**Gazette**, why newspapers called, 10-74  
**"Gazette of the United States, The,"** 7-193  
**Gears**  
   mechanical principle, 1-\*330, 331  
   operation of, in automobile, 10-†289  
**Gecko**, lizard, 3-†448, 449  
**Geese**, 9-\*353, 357, 358  
   Egyptian painting of, 11-\*12  
   Rome saved by cackling of, 5-203  
   wild, 4-\*1, †120-22  
**Geiger counter**, electronic device, 1-558-H: 9-\*424  
**Geiranger Fiord**, Norway, 6-\*372  
**Geisha girls**, Japanese entertainers, 12-\*333  
**Gelatin**, lack of amino acid in, 2-363  
**"Geld gab ich für Eisen,"** picture, 6-\*225  
**Gelée, Claude** (Claude Lorraine), 11-†234 fol.  
   "Ancient Port of Ostia, The," painting, 11-\*230  
   "Departure of Cleopatra, The," painting, 11-\*238  
   "Arnassus," painting, 11-\*236  
**Gem State** (Idaho), 8-92-B

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

- Gemara**, part of Talmud, 5-133  
**Gemini**, constellation, *see* Twins  
**Gempei**, Japanese civil war period, 5-349  
**Gems**, main article, 9-†428-33  
     cameo, 12-101, 105, 124  
     carving, 12-†101 fol., 122, \*123  
     color, 9-432  
     color plate, 9-frontispiece  
     cutting, 9-\*429, †430  
     diamonds, 9-†429-31  
     emeralds, 9-433  
     hardness; uses, 9-431, 433  
     intaglio, 12-122  
     opals, color plate, 9-frontispiece, 433  
     rubies, color plate, 9-frontispiece, \*431  
     sapphires, color plate, 9-frontispiece, 431, 432  
     scarabs, 12-\*119, 122  
     South America's production, 5-518-B  
     synthetic, 9-429, 432, 433  
     *see also* Jewels  
**Gemsbok**, antelope, 4-416  
**Gene**, hereditary element in cell, 2-\*279  
**General assembly**, state law-making body, 7-385  
**General Education Board**, 12-583  
**General Federation of Women's Clubs**, 14-548  
**General Grant Tree**, 8-42-B  
**"General Sherman,"** giant sequoia, 2-249, 7-407  
**General Sherman (M4)**, tank, 10-368-F  
**General Staff School**, U. S. Army, 7-478  
**Generation**, *see* Reproduction  
**Generations, alternation of**, *see* Alternation of generations  
**Generator, electric**, *see* Dynamos  
**Generator**, of gas refrigerator, 1-\*409, 410  
**Genesee River**, U. S., 8-341  
**Genêt, Edmond**, in United States, 7-195, 196\*  
**Genet**, animal, 4-\*284, 296  
**Geneva**, Switzerland  
     average rainfall, 6-254-B  
     Calvin's influence, 13-\*547, 548  
     conference on naval disarmament, 7-484  
     headquarters of Protestantism, 6-252  
     location, 6-254-B  
     mean temperature, 6-254-B  
     Red Cross organized, 7-428  
**Geneva, Lake of**, Switzerland, map, 6-584  
**Geneviève of Nanterre, Saint**, 12-†366-67  
**Genghis Kahn**, Asiatic conqueror  
     advance of Mongols under, 5-437  
     conquers Persia, 5-105  
     invades Russia, 6-426  
     invasion of China; character, 5-327  
     invasion of Europe, 5-270  
**Genoa**, Italy, port on Mediterranean, commerce and industries, 10-260  
     imitation of Venetian needlepoint, 12-170  
     map, 6-588, B2  
     Middle Ages, 6-296, 297  
     ships and trade, 10-167  
**Genoa, Gulf of**, Italy, map, 6-588  
**Genseric**, king of the Vandals, *see* Gaiseric  
**Genth, Lillian**, painting by, 11-\*367  
**Gentile**, *see* Fabriano, Gentile da  
**Gentiles**, rift between Jews and, 5-132  
**Gentlemen Adventurers of England**, Hudson's Bay Company, 10-138  
**Genus**, botany, 2-183  
*Genus Passiflora*, flower, 8-374  
**Geodetic Survey**, U. S., 7-380  
**Geoffrey, Prince**, count of Brittany, 12-372  
**Geoffrey of Monmouth**, "The History of the Kings of Britain," 14-377  
**Geography**  
     atmosphere or air, 1-†216-20  
         air resistance, 1-295, 319  
         atmospheric pressure and weather, 1-†258-61  
         chemical composition, 1-†372-77: 1-219  
         height of atmosphere, 1-217, 372  
         weight, 1-454, 472  
     atmosphere and climate  
         atmospheric pressure, 1-†258-61  
         isobars, 1-277  
     effect on man, 1-†193-97  
     moisture in atmosphere, 1-219, †239-42  
         condensation and precipitation  
         clouds, 1-†234-37  
         dew, 1-†210, †241  
         evaporates into atmosphere, 1-393  
         fog, 1-\*237, 241-42  
         frost, 1-237, 240, \*251  
         hail, 1-†249, 407  
         humidity, relative, 1-393  
         rain and rainfall, 1-†244-46, 254-56  
         snow, 1-†251-54  
     temperature, 1-†206-11  
         effect of ocean currents on, 1-223  
         measurement, 1-†207-8, †388-93  
**Weather Bureau's work**, 1-†274-78  
     weather maps, 1-276, 277  
     winds, 1-†222-32  
         effect on climate, 1-225  
         rainfall and, 1-246  
     storms, *see* Storms  
**earth in space**, 1-†13-16  
     formation, 1-†1-11  
     gravitation, 1-†14-16, \*301-3  
     magnetic force, 1-488  
     movements  
         revolution around sun, 1-14, \*201, †202-3  
         rotation on axis, 1-9, 202  
             affected by tides, 1-135  
     significance of movements  
         day and night result of rotation, 1-9, 202  
         seasons result of revolution and tilted axis, 1-†111, \*201, †203-4, †206, †210  
     sun, 1-†108-18  
     *see also* Astronomy; Solar system  
     hemispheres of earth, 5-518-B  
     land disturbances  
         earthquakes, 1-†79-82  
         volcanoes, 1-†74-76

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Geography—continued**

## land formations

- caves and grottoes, 1-†84-87
- coast lines, rising and sinking, 1-†69-72
- continental shelf of ocean, 1-69; 9-364
- deserts, cause of, 7-465-66; *see also* Deserts
- islands, formation, 1-76; 3-63
- coral, 1-56
- volcanic, 1-76; 5-521, 526, 528; 6-489, 491

- mountains, 1-†18-29; *see also* Mountains
- prehistoric topography, 3-10, 15, 22, 57, 61; 5-26

- valleys, 1-19, 25; 3-3

- World map, 5-573

## rock and soil formation

- igneous rock, 1-11, 19
- minerals, *see* Contents Volume 9
- sedimentary rock, 1-11, \*19, 20
- soil formation, 1-†94-97
  - conservation, 7-465 fol
  - glacial, 1-†97
- see also* Rocks

## tides, cause, 1-133, \*135, 137

- effect of sun upon, 1-134
- effect upon earth's rotation, 1-9, 135
- efforts to harness power of, 9-440
- height, 1-134

## water

- amount on earth, 1-\*363, 364
- amount used daily by Americans, 10-535
- composition, 1-†363-65
- first on earth, 1-11, 47
- importance to health, 2-420

## water formations

- hot springs and geysers, 1-†32-36
- inland waterways, 10-†252-68
- lakes, formation of, 1-92
- oceans, 1-†66-67
  - currents, 1-67
- international trade carried on over, 10-†231-42
- tides, *see above* tides
- lost, 3-35
- streams, formation, 1-†46-49
- underground, 1-†89-92
- see also* Rivers

## zones of earth, 1-204

*see also* subhead physical features under names of countries and under names of various states of United States, and also Earth, Geology

**Geological Survey, U. S. Department of the Interior, 7-378****Geology, defined, 1-39; main article, 1-1-93 (*see also* Contents Volume 1 for chapter headings)**

- California; formation of land, 8-33-34

- caves and grottoes, 1-†84-87

- coastlines changed by sea, 1-†69-72

- coral reefs and atolls, 3-†56-57, †97-101

- earthquakes, 1-†79-82

- earth's age, 1-†43-44

**Geology—continued**

- earth's crust, 1-†38-41

- earth's hot center, 1-†31-36, 383

- earth's shape, position, movement in space, 1-†13-16

- earth's origin and formation, 1-†1-11

- eras and periods, list, 1-40

- eras described, 3-6

- forms of life in, chart, 3-64

- rock formation in, color plate, 3-\*8; diagram, 1-\*40

- see also* under names of eras, as Archeozoic era and names of periods, as Carboniferous period

- erosion of soil, 7-469

- "faults," 1-81

- fossils, 3-5; *see also* Fossils

- geosynclines, 1-20

- Glacial Age and glaciers, 1-†59-64

- studied by Agassiz, 1-61; 13-432

- glacial till, 1-\*63

- leaching of soil, 7-470

- Lyell's theory of rocks and fossils, 13-430-31

- mountains, 1-†24-29

- formation, 1-†18-22

- Niagara Falls, 1-†78

- ocean, 1-†66-67

- ancient sea, Tethys, 5-432

- petrified wood, 9-315

- potholes, 1-\*62

- present, key to past, 3-3

- rock formation, 1-†51-54

- igneous and sedimentary, 1-11, \*19, 20; 3-2

- past recorded in, 3-†1-6

- soil formation, 1-†94-97

- springs, 1-†90, \*91

- hot, 1-†32-36

- strata, 3-2, color plate, frontispiece

- division into geologic periods, 1-\*40

- underground waters, 1-†89-92

- volcanoes, 1-†74-76

- water courses, formation of, 1-†46-49

- see also* Earth; Prehistoric period; Rocks

- "Geology, Principles of," by Lyell, 13-431

- Geometric design, in pottery, 12-\*47, \*49, \*50, \*51, 52

- Geometry, mathematics, 10-435-40

- analytical geometry, 10-425

- beginning of, 10-423

- definition, 10-435

- Euclid the father of, 10-423; 13-373

- George, David Lloyd, *see* Lloyd George

- George, Saint, legends about; slays dragon,

- main article, 13-†524-25

- painting by Mantegna, 11-\*140

- Spanish painting, 11-\*242

- statue by Donatello, 11-128, \*129

- George I, king of England, 6-74

- portrait, 6-\*75

- George II, king of England, portrait, 6-75, \*78

- Georgia named after, 8-84

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**George II—continued**

Oglethorpe granted charter by, 8-78  
repurchase of Carolina territory, 8-287

**George III, king of England, 6-75, \*80, 81**

favorite painters, 11-304  
last days, 6-90  
portrait, 7-\*158  
treatment of American colonies, 7-160

**George IV, king of England, 6-90****George V, king of England, 6-101, 108**

at World Conference, 7-\*341-A  
death, 6-108  
National Library of Wales founded by, 6-141  
portrait, 6-\*103; 12-\*551  
reforms in India, 5-386

**George VI, king of England, 6-†108**

at session of Canadian Parliament, 7-\*29-C

**George II, king of Greece, 5-182**

recalled to throne, 6-368-B

**"George V," monster locomotive, 10-183****George, Fort, in Oregon, 8-326****George, Lake, New York, 8-265, 283****"George Dandin," by Molière, 13-112****George Washington Memorial Bridge, New York City, 10-\*213**

compressed air used in construction, 1-462  
expansion and contraction of cables, 1-478  
size, 8-270

**"Georgia," song, 8-84-A****Georgia, republic, U.S.S.R., 6-368, †443-B; 5-395; 12-449-D****Georgia, state, U. S., description and history, main article, 8-†78-83; general data, 8-84-84-B**

agriculture, 8-80, †81, 82  
soil erosion, 8-83; 7-\*468, 469  
animal life, 3-426

area, 8-84

capital and capitol building, 8-\*78

charities and correction, 8-84

cities, towns, list, 8-84-A, 83

climate, 8-84

counties, list, 8-84-A

education, 8-83

institutions of higher learning, list, 8-84  
flag, 8-84-A

history, 8-78-79, 81

Civil War, 8-81

forces Indians to migrate, 8-79; 7-226

Franklin represents in England, 12-466

gives up western land claims, 7-176

granted to James Oglethorpe, 8-78; 7-130

Revolutionary War, 8-79

signs Declaration of Independence, 7-173  
holidays, 8-84-A

Indians, 8-79; 7-\*101, 226

industries, *see below* Products and industries

interesting facts, 8-84-A

location, 8-84

map, 8-486; 7-595

monuments, 8-84; 7-\*413

motto, 8-84-A

**Georgia—continued**

name, 8-84

physical features, 8-84, 80

political facts, 8-84

products and industries, 8-80-81, 83

cotton, 8-†81, 82, 83

early, 8-79

natural resources, 8-83

turpentine, 8-\*82

*see also* agriculture *above*

reservations, game and bird, 8-84

rivers, 8-84

state bird, 8-84-A

state flower, 8-84-A

state song, 8-84-A

water power, 8-81

**Georgia, University of, Athens, Ga.**

branches, list, 8-84

School of Law building, 8-\*80

**Georgia Warm Springs Foundation, for treating infantile paralysis, 12-555-C, 555-D****Georgian architecture, in America, 11-†501-8**

University Hall, Brown University, 8-\*344

**Georgian Bay Islands, national park, Canada, 7-29-Q****"Georgics," by Virgil, 13-48; 8-320-B****Geosyncline, of earth's crust, 1-20****Geraint, Sir, in Arthurian romances, 14-†38, 3-86****Geranium, plant, breeding of, 2-229****Géricault, Jean Louis André Théodore, art style, 11-†322**

and Delacroix, 11-328

"Raft of the Medusa," painting, 11-†322

**Gericke, William F., botanist, 9-54****Germ, of seed, 2-126****"Germ, The," Pre-Raphaelite magazine, 13-256****Germ theory of disease, studies of Behring and Metchnikoff, 2-344, 349****German art, *see* Germany, art****German cockroach, 3-355****German Confederation, 6-226, 227, 229**

Austria's withdrawal from, 6-271

**German East Africa, 5-461****German language**

derivation, 10-5

Grimm's Law, 13-284

**German literature, 6-227**

biographies, 13-†276-89

Goethe, 13-†280-83

Grimm Brothers, 13-283-85

Heine, 13-285-86

Herder, 13-†276-77

Lessing, 13-287

Mann, 13-†288-89

Schiller, 13-†277-80

*see also* writers listed in index

"Nibelungenlied," 14-†310-17

poetry and legends of the Middle Ages, 6-210

**German music and musicians**

Bach, 12-229-32, †261-63

Beechoven, 12-239-42, †277-80

beginnings, 12-277

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**German music and musicians—continued**

Brahms, 12-246, 301-2  
 Handel, 12-†263-65  
 mastersingers, 12-217  
 Mendelssohn, 12-245, 246, †286-88  
 minnesingers, 12-216  
 musical instrument, 12-\*226  
 opera, 12-249-52, 294; 14-310  
 Schumann, 12-245, †289-90  
 songs, 12-243, 244  
 Strauss, 12-252, †315-16  
 Wagner, 12-249-52, †293-96  
 Weber, 12-†281-82

*see also* Austria, music and musicians

**German Reich, 6-240**

"German Requiem," by Brahms, 12-302

**German silver, 9-420**

poor conductor of electricity, 1-514

**Germani, 6-241-B**

"Germania," by Tacitus, 13-56

**Germanic peoples, general description, 6-204-6**

Austria, 6-258  
 Britain, 6-6, 10-10  
 distribution in Middle Ages, map, 6-\*206  
 Europe, today, 6-162-1)  
 Gaul, 6-166, 211  
   use of iron, 12-4  
 life and customs, 6-205  
 migrations, 5-264 fol., 290, 292; 6-206  
 mythology, 6-205  
 Norway, 6-407-A  
 Rome

Marcus Aurelius and, 5-242  
 Marius and, 5-219  
 Odoacer and Theodoric, 6-293  
 Rome taken in 410 A.D., 11-452  
 Visigoths, 5-253

Scandinavia, 6-372

Sweden, 6-407-B

Switzerland, 6-244, 246

*see also names of tribes, as Angles; Saxons*

**Germanium, element, symbol, atomic no. and weight, 1-\*551****Germantown, Pa., 8-335****Germanus, missionary to Britain, 6-145****Germany, country, Europe, description and history, main article, 6-†204-41; general data, 6-241-B (*see also* Contents Volume 6)**

*see also* index World War II, 6-493

agriculture, 6-241-B, 204

potatoes grown for alcohol, 7-453

animal life

storks, 4-197

wolves, 4-299

area, 6-241-B

armament, 6-240, 241

arms and armor, 10-\*353, \*355, \*356, \*359

art; painting, 11-†205-14

beer drinking, 10-257

castles, 10-\*361

cities, 10-257-58, 259

climate, 6-241-B

**Germany—continued**

common people

clearing of forests for farming, 6-210

during World War I, 6-237

growth of democratic ideas, 6-227

Peasants' War, 6-213

preceding World War I, 6-235

ravages of Thirty Years' War, 6-214, 217

social laws, 6-233, 234

under Frederick the Great, 6-222

costume, 9-\*2, \*23

crafts

bronze work, 12-\*21, †22

carving, 12-\*99; 11-206

enameling, 12-66

engraving, 11-206

glassware, 12-\*33

porcelain, 12-42, †40, \*46, 60

silversmithing, 12-\*88, 90

stained glass windows, 12-\*75, 77

woodcuts, 11-206

divisions, 6-241-B

drama and theater, 12-332, 333

early newspapers, 10-74

emigration to America

Illinois, 8-98

Ohio, 8-309

Wisconsin, 8-442

flags, 6-240; color plate, 14—following 570, no. 26

forests, 6-241-B

golden age, 6-227

government, 6-241-B

constitution done away with, 6-240

hanging railways, 10-\*199

history

to 1648, 6-†204-14

Middle Ages, 5-286, †295-99

Guelphs and Ghibellines, 5-\*293, 297, 299

Knights of the Sword, 6-446 fol., 461 fol.

in Poland, 6-446

political organization in Middle Ages, 6-210

breaking up of nation, 6-211, 214

Reformation, 6-212-14

Thirty Years' War, 6-181, 214

1648 to 1870, 6-†216-29

under Frederick the Great, 12-†418-19

Napoleonic Wars, 6-\*223, †224-26; 12-\*428, 430, 432

German Confederations, 6-226, 227, 229, 271

constitution: granted, 6-227, 228

Franco-Prussian War, 6-200, \*216, 229, 12-448, 449

empire established, 6-229, †231; 12-447-49

1871 to the present, 6-†231-41

policies of Bismarck; alliances, 6-233

reign of Kaiser Wilhelm II, 6-234-38

dispute with America over occupation of Samoa, 7-289

Triple Alliance, 6-233, 273

World War I, 6-201, 235; 7-†318, 320

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Germany, history, 1871 to the present—continued**

- Belgium's resistance to, 6-346, 352
- reparations, 6-238, 239, 241
- submarine warfare, 10-310
- Treaty of Brest-Litovsk, 6-439
- relations with Estonia, 6-463, 464
- republic established, 6-238
- since World War I, 6-239
- under Nazis, 6-240; 7-555
- and Austria, 6-241, 275
- Saar Basin regained, 9-442
- relations with Italy, 6-315
- European War (1939), 6-241
- destruction by Allied bombers, 6-\*241-A
- war crimes trial, 6-\*241-A
- see also* Prussia, history, and *also under names of leaders, as* Bismarck-Schönhausen, Otto F. L. von
- Ice Age, 1-61
- industrialization, 6-234
- industries, *see below*, products and industries
- Jews persecuted by, 6-240-41, 497
- Kiel Canal, 10-274
- land Zeppelin, 10-\*199
- location, 6-241-B
- maps, 6-582
  - distribution of Germanic peoples, 6-206
  - on map of Europe, 6-570
- music, *see* German music
- navy before World War I, 6-235
- New Year's, 14-578
- Pennsylvania settlers, 8-335
- people, 6-241-B
  - racial classification, 5-44
- philosophers, 6-228
- physical features, 6-241-B
- possessions
  - Africa, 6-233; 5-448, 461
  - Pacific islands owned by, 5-522, 528
- products and industries
  - aluminum, 9-422
  - beet-sugar production, 9-126
  - cheese, 9-348
  - chemical dyes, 9-306
  - coal, 9-438
  - industries and transportation of products, 10-256-58
  - iron and steel production, 9-408
  - peat, 9-438
  - potash, 1-97
  - potato production, 8-197
  - poultry, 9-358
  - silver, 9-389
  - see also* agriculture *above*
- reforestation, 2-242
- relations with Luxemburg, 6-469
- religious situation, 7-556
- rivers, 10-257-58, 259; 6-241-B
- social legislation, 6-233, 234
- socialist party, 7-551
- trade, 10-256-58
- Cologne, 6-\*240

**Germany, trade—continued**

- Customs Union, 6-228
- Dresden, 10-257
- Hamburg, 6-\*239
- merchant marine, number, 10-232
- Nuremberg, 6-\*240
- tobacco import, 9-223
- transportation, 10-256-58
- Germicides**, 10-550; *see also* Insecticides
- "**Germinal**," by Emile Zola, 13-135
- Germination in seed**, conditions affecting, main article, 2-†216-19
- wheat seed, 9-\*99
- Germs**
  - bacteria, 2-†12-21; *see also* Bacteria
  - destruction of
    - by antiseptics, 13-372
    - by blood, 2-344, 349
  - diseases caused by, 2-†349, 420
  - animal carriers, 4-383, 2-18, 388
  - in water supply, 10-542
  - lungs protected against, 2-336
  - see also* Bacteria
- Gernot**, character in "Nibelungenlied," 14-311
- Gérôme, Jean Léon**
  - influence of, 11-340
  - painting by "Cockfight," 11-\*338
  - teaches American artists, 11-360
- Gerritsz, Dirk**, voyage of, 13-504
- Gerry, Elbridge**, vice president of the United States, 12-456-F
  - at Constitutional Convention, 12-496
- Gershwin, George**, composer, 12-257, 13-355
- Geryon**, mythological monster, 14-429
- Gessler, Hermann**, 12-374
  - and William Tell, 6-246, 247
- Gesso**, furniture decoration, 12-186
- "**Get Out and Get Under**," song, 10-279
- Gettysburg, Pennsylvania**
  - Lincoln Memorial, 7-\*267
  - national cemetery and park, 7-414
  - New York State Monument, 7-\*413
  - Peace monument, 7-\*273
- Gettysburg, Battle of**, 7-263
- Gettysburg Address**, text, 12-\*531, 532
- Gettysburg National Military Park**, 7-414
- Gewandhaus concerts**, Mendelssohn director of, 12-287, 288
- Geysers**, from underground streams, 1-†32-36, \*344
  - Yellowstone National Park, 7-406
- Géza**, king of Hungary, adopts Christianity, 6-278
- Ghats**, mountain ranges, India, 5-387-A
  - map, 5-587
- Ghent, Belgium**, 6-348
  - van Eyck's painting of cathedral, 11-194, 195
- Ghent, Joos van**, painting, color plate, 11-\*360
- Ghent, Treaty of**, 7-15, 211
  - signing, 6-\*91
- Ghetto system**, Jews living under, 5-135, 138

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

- Ghibellines**, political faction  
 origin, 5-297  
 struggle with Guelphs, 5-298, 299; 6-209, 297, 298  
 territory of, in Germany, 5-\*293
- Ghiberti, Lorenzo**, 11-125, †127, 128  
 Baptistery doors of Florence made by, 12-22, \*23; 11-125, \*127, 128  
 carvings, 11-128  
 mastery of goldsmith's art, 12-88, 125  
 painting by Vasari, showing Brunelleschi and Ghiberti, 11-\*482  
 study of classic art, 11-127
- Ghirlandaio, Domenico**, 11-145-46  
 Michelangelo becomes pupil, 11-158  
 paintings, 11-\*144, 145, 146, 152  
 "Birth of St. John the Baptist," painting, 11-\*144  
 studio; pupils, 11-145
- Ghost butterfly**, 3-283
- Ghost forests**, 2-\*240
- Ghosts**, game, 14-150
- "Ghosts,"** play by Ibsen, 12-333
- "Giant, The,"** statue by Michelangelo, 11-\*155
- Giant armadillo**, 4-455
- Giant cactus**, *cactus*
- Giant clam**, of East Indies, 3-160
- Giant condor**, attempted battle with airplane, 10-313
- Giant Forest**, sequoias, 7-407
- Giant grasshopper**, 3-\*274
- Giant moa**, extinct bird, 4-233
- Giant pangolin**, toothless mammal, 4-456
- Giant petrel**, bird, 4-217
- Giant salamander** (hellbender), 3-430
- Giant sequoia**, *see* Sequoia
- Giant skink**, 3-459
- Giant toads and frogs**, 3-422, \*424, 426
- Giant tortoise**, 3-468, \*471, \*479
- Giant trees**, *see* Trees
- Giantess**, geyser, 7-406
- Giants**, caused by over secretion of pituitary gland, 2-324
- Giant's Castle**, mountain, Africa, 5-491-B
- Giant's Head**, cliff, England, 3 \*12
- "Giants in the Earth,"** novel by Ole Rølvaag, 13-352
- Gibbon, Edward**, life and work, main article, 13-†200  
 friend of Dr. Johnson, 13-195  
 portrait, 13-\*200
- Gibbons, Grinling**, carvings, 12-107, 192
- Gibbons, Orlando**, 12-222
- Gibbons**, apes, 4-248, †249
- Gibbs, James**, English architect, 11-508
- Gibbs, James A. E.**, improvements on sewing machine, 10-444
- Gibraltar, Rock of**, 6-342-A  
 a coaling station, 10-237
- Gibraltar, Strait of**, Africa and Europe  
 maps, 5-574; 6-570  
 once dry land, 3-61; 6-317
- Gibraltar House**, Hovenweep, Colo., 5-\*21
- Gideon**, Jewish leader, 5-120
- Giffard, Henri**, flight in airship, 10-316
- Gifford, Walter S.**, photograph of, 10-\*124
- "Gil Blas,"** by Le Sage, 13-116
- Gila Cliff Dwellings**, New Mexico, 7-421
- Gila monster**, 3-458, \*459
- Gila River**, U. S., 8-24  
 temperature of surrounding country, 8-20
- Gilbert, Alfred**, 11-318
- Gilbert, Cass**, American architect.  
 Minnesota capitol designed by, 8-\*189  
 Woolworth Building designed by, 11-517, 524
- Gilbert, Sir Humphrey**  
 and Raleigh, 7-121; 13-479  
 in Newfoundland, 7-†32  
 tries to found American colony, 7-121
- Gilbert, William**, experiments with magnetism, 1-494
- Gilbert, William**, sugar bowl by, 12-\*91
- Gilbert, William Schwenk**, 12-320; 11-359
- Gilbert Islands**, Pacific, 5-521
- Gilchrist, Connie**, portrait by Whistler, 11-\*357
- Gildas**, on plight of Christian Celts, 6-137
- Gilded Age**, in U. S. history, main article, 7-†276-83, 289
- Gilds**, *see* Guilds
- Gill**, unit of measure, 10-375
- "Gilles,"** painting by Watteau, 11-\*280, 281
- Gillis, Peter**, portrait, 11-202
- Gillot, Claude**, 11-281
- Gills**  
 fishes, 3-†196, \*233, 252  
 mollusks, 3-142, †152  
 newts and salamanders, 3-430, 431  
 salamanders, 3-431  
 toads and frogs, 3-418
- Gilman Hall**, Johns Hopkins University building, 8-†50
- Gilmer, B. T.**, music to "The Call of Virginia" by, 8-418-A
- Gin**, cotton, *see* Cotton gin
- Ginger**, 9-209
- Ginger root**, 9-\*208
- Gingerbread house**, color plate, 14-\*198
- Ginneries**, cotton, 10-407
- Ginza**, street, Tokyo, 5-\*361
- Gioconda, La**, *see* Mona Lisa
- Giorgione**, Italian painter  
 association with Titian, 11-177  
 paintings, 11-176, 177  
 "The Concert," 11-\*178
- Giotto di Bondone**, Italian painter, 11-†110-18, 124  
 campanile of cathedral in Florence, 11-\*118  
 hands in pictures of, 11-152  
 painting of St. Francis, 13-529  
 paintings  
 "Meeting of St. Joachim and St. Anna at Jerusalem," 11-\*115  
 "St. Francis Preaching to the Birds," 11-\*116

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Giotto di Bondone, paintings—continued**

- "St. Joachim returning to the sheepfold,"  
11-<sup>\*</sup>115  
"Taking of Christ," Padua, 11-<sup>\*</sup>113  
sends circle to Pope; secret of his genius, 11-  
118

**Gipsies, see Gypsies**

- Giraffe**, animal, 4-†403-5  
drawing and mounting, 14-<sup>\*</sup>66  
zoo, 4-<sup>\*</sup>478, <sup>\*</sup>480

**Giraffe camels**, 3-<sup>\*</sup>48**Giralda of Seville**, tilework, 12-56**Girardon, François**, sculptures, 11-<sup>\*</sup>231, <sup>\*</sup>232**Girders, steel**, expansion and contraction, 1-479**Girdle**, section of cut diamond, 9-<sup>\*</sup>430**Girl Guides**, 14-546**"Girl in White, Ernesta,"** painting by Cecilia Beaux, 11-<sup>\*</sup>363**"Girl of the Golden West, The,"** opera by Puccini, 12-253**Girl Scouts**, main article, 14-†546-48

home-making activities, 14-547, 548

membership conditions, 14-547, 548

oath and requirements, 14-548

**Girls**

Mohammedan attitude toward, 5-419, 423

weight and measurement chart, 2-363

**Gironde**, political division, in French Revolution, 6-192, 193**Gislason, Konrad**, 6-420**"Give me liberty or give me death!"** Patrick Henry's demand, 12-<sup>\*</sup>482, 483**Gizeh**, Egypt, pyramids, 5-55; 11-<sup>\*</sup>403Great Pyramid (of Khufu), 5-54, 185, <sup>\*</sup>186; 11-<sup>\*</sup>10, †409-10Great Sphinx, 5-†55; 10-481; 11-10, <sup>\*</sup>413**Glacial (Pleistocene) epoch**, 1-†59-63; 3-†59-62

cause of Ohio's fertile soil, 8-307

causes, 1-61

discovered by Agassiz, 13-432

forms of life in, table, 3-64

lakes formed by, 1-92

Maine, 8-150

Michigan; effects of, 8-180

Minnesota, 8-190

North Dakota, 8-298

on east shore of Baltic, 6-460

Permian period, 3-35

rock formation, 1-<sup>\*</sup>40

Scandinavia, 3-60; 6-371

Wisconsin, 8-439, 446

**Glacial moraine**, Long Island, N. Y., 8-268**Glacial soil**, 1-†97**Glacial till**, 1-<sup>\*</sup>63**Glacier Bay**, Alaska, national monument, 8-16-A**Glacier National Park**, Canada, 7-29-W**Glacier National Park**, Montana, 8-220-A; 7-406, 407**Glaciers**, 1-†59-64action upon rocks, 1-†60, <sup>\*</sup>62, <sup>\*</sup>63, 97

Agassiz's discoveries, 13-432

**Glaciers—continued**

Alaska, 1-59, 64; 8-16

Alps, 1-61; 13-<sup>\*</sup>433

California, 8-34

effect upon water courses, 1-60, 92

evidences, 1-†60, <sup>\*</sup>62, <sup>\*</sup>63

Finland, 6-464-B

Glacier National Park, Montana, 7-406

Greenland, 1-61, 63; 3-59; 6-482

Himalaya Mountains, 3-60; 5-432, 441

icebergs from, 1-63

New York; evidences, 8-268

New Zealand, 3-60

Norway, 6-407-A

Pleistocene period, 3-<sup>\*</sup>59, 60

South Georgia, 6-492

Tyndall's studies, 13-<sup>\*</sup>389, 390*see also* Glacial epoch**"Glaciers of the Alps, The,"** by John Tyndall, 13-390**Gladiatorial show** invented by Etruscans, 5-194**Gladiators, Roman**, 5-<sup>\*</sup>234, <sup>\*</sup>249

physicians in schools of, 13-359

**Gladkowska, Constance**, and Frédéric Chopin, 12-292**Gladstone**, chess player, game, 14-490**Gladstone, William Ewart**, life, main article, 12-442-43

fights for Irish Home Rule, 12-443

opposition to Disraeli, 12-443

policies and reforms, 12-443, 6-99

portrait, 12-<sup>\*</sup>442**Gladstone, Herbert John**, viscount, governor general of the Union of South Africa, 5-491**Gladwin, Major**, and Chief Pontiac, 7-<sup>\*</sup>10**Glands**

digestive juice, 2-†355, 356

ductless, 2-357

growth of bones regulated by, 2-324

lacrimal (tear), 2-<sup>\*</sup>292, 299, 300**Glarus**, canton, Switzerland, joins Swiss Confederation, 6-248**Glasgow, Ellen**, author, 13-352**Glasgow**, Scotland

map, 6-575, D4

shipbuilding, 10-254

trade with American colonies, 6-132

**Glass, burning**, 1-†430, 432

experiments with, 1-115, †116, †209

**Glass and glassware**, main article, 12-†26-38; 9-386

batiked, how to make, 14-†55

beads, 12-27, 32, 36

made in Czechoslovakia, 6-357

blown, 12-<sup>\*</sup>30, 31

carving in, 12-107

chemical knowledge necessary, 10-545

coloration, 12-30, 72, 74

cut, 12-31, †34, 35

decoration, 12-31

effect of heat on, 1-479

enamel a peculiar kind of, 12-63

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Glass and Glassware—continued**

- favrite, 12-77  
 furniture made of, 12-199  
 how made; use in building, 9-386  
 inlay of, in Roman furniture, 12-\*179  
 insulating properties, 1-396, 514  
 jewelry, 12-27, 28, 32, 36, 110, +124  
 lenses made of, *see* Lenses  
 made from silica, 1-537  
 manufacturing centers  
   New Jersey, 8-247  
   Ohio, 8-310  
   West Virginia, 8-435-36  
 material used, 12-26  
 melting point, 1-\*392  
 mirrors, 13-387  
 mosaics, 12-71, 111, 112, 115; 11-77  
 natural, made by volcano, 7-69  
 new inventions and processes, 12-38  
 "non-shatter," 10-281, 553  
 painted, 12-72, 74, 76  
 plastic, 10-\*551, 553  
 plate, 9-386; 10-548  
 polishing, 8-\*311  
 prism; reflects light, 1-+271  
 red, 12-30, 31  
 sea creatures modeled in, 3-105  
 styles  
   American, 12-+36-38  
   ancient, 12-+26-31  
   Belgian, 12-34  
   Bohemian, 12-\*33, 34  
   Czechoslovakian, *see above* Bohemian  
   Dutch, 12-\*33, +34  
   Egyptian, 12-+26-27, 31  
   English, 12-\*33, +34  
   French, 12-38  
   German, 12-\*33, 34  
   Greek, 12-+28  
   Phoenician, 12-26  
   Renaissance, 12-+31-34  
   Roman, 12-+27-29, \*31  
   Stiegel, 12-36, \*37  
   Swedish, 12-38  
   Syrian, 12-27, \*33  
   Venetian, 12-+31-34  
 window, 10-548  
*see also* Stained glass
- Glass brick**, 10-548  
**Glass eels**, fishes, 3-251  
**Glass gooseberries**, jellyfish, 3-113  
**Glass ropes of sponge**, 3-\*84, 85  
**Glass snake**, lizard, 3-459  
**Glass-Steagall Bill**, 12-456-1)  
**Glasses, colored**, 1-439  
**Glassworks**, locations, 12-29, 36  
**Glaucus**, invents iron welding, 12-3  
**Glaucus**, god, and Scylla, 14-420
- Glazes and glazing**  
 art discovered by Sumerians, 11-407  
 bricks, 9-379  
 colored, of Luca della Robbia, 11-130, \*131

**Glazes and Glazing—continued**

- Mesopotamian tiles and bricks, 12-55; 11-24, \*27, 28  
 pottery, 12-42, 46, 54, 55  
 preservation of pictures first use, 11-198  
 "Gleaner," painting by Jules Breton, 11-\*330  
 "Gleaners," painting by Jean F. Millet, 11-\*329  
**Glen More**, or **Great Glen of Albin**, Scotland, 6-108-B  
**Glencoe, Massacre of**, 6-129  
**Glendalough, Vale of**, monastery ruins, 6-\*146  
**Glendower, Owen**, unites Wales; leads revolt against England, 6-139, 35  
**Glidden, Carlos**, typewriter, 10-64  
**Gliders**, 10-\*315-16, 317, 368-F  
   planned by Leonardo da Vinci, 10-\*315  
   toy, how to make, 14-+47  
   Wright brothers, 10-317  
**Glinka, Michael**, 12-254  
**Global Map**, 10-328-E  
**Globefish**, 3-+207  
**Globigerina**, annulcule, 3-\*77, 79  
**Globigerina ooze**, 3-79  
**Glockenspiel**, *see* Carillon  
**Glommen River**, Norway, 6-407-A  
   map, 6-597  
**Gloriana**, Spenser's name for Queen Elizabeth, 13-150  
**Glorious Revolution of 1688**, 6-72  
**Glossary**, defined, 10-19  
**Glossy ibis**, bird, 4-\*148  
**Gloucester, Mass.**, 8-168  
**Gloucester, N. J.**, former site of Fort Nassau, 8-250  
**Gloucester county, N. J.**, agriculture, 8-245  
**Gloucester Street**, Williamsburg, Va., 7-412  
**Glover, George W., Major**, husband of Mary Baker Eddy, 13-557  
**Gloversville, N. Y.**, industry, 8-281  
**Glowworm**, 3-343  
   larva, 3-\*342  
**Gluck, Christoph Willibald, life and works**, main article, 12-+270-72  
   "Orfeo"; music of, 12-237  
   Piccini a rival of, 12-272  
   portrait, 12-\*241  
**Glue**  
   made from hoofs of steer, 9-328  
   waterproof; casein in, 10-547  
**Glumdalclitch**, giant child in "Gulliver's Travels," 14-350  
**Glumes**, botany, 2-145  
**Gluten**, in flour, 9-102  
**Glutton** (wolverine), 4-+359  
**Glycerin**, boiling point, 1-\*392  
   specific gravity, 1-474  
**Glycogen**, animal starch, 2-361  
**Gnats**, 3-360  
   water gnats, 3-388  
   *see also* Mosquitoes  
**Gnawing animals**, rodents, 4-+364-76  
   beavers, 4-\*373-76

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Gnawing animals—continued**

prairie dogs, 4-<sup>\*</sup>370-71  
squirrels, 4-<sup>\*</sup>364, <sup>†</sup>365-70

**Gnome**, 14-177

**Gnossus**, *see* Cnossus

**Gnu**, antelope, 4-<sup>\*</sup>395, <sup>†</sup>422

**Go devil**, sled, 9-251

**Goa**, territory, India, Portuguese headquarters, 5-378

**Goat**, constellation, *see* Capricornus

**Goat Island**, Niagara Falls, winter scene, 1-<sup>\*</sup>254

**Goat Island Bird Refuge**, 8-332

**Goats**

domesticated, 4-<sup>\*</sup>430  
drawing and mounting, 14-<sup>\*</sup>63  
hair used in rug weaving, 12-156  
horns, 4-<sup>\*</sup>423  
milk, 9-332, <sup>\*</sup>335  
silver, found in Sumeria, 11-24  
wild, 4-<sup>\*</sup>423, 425, <sup>†</sup>427-30  
zoo home, 4-478, <sup>\*</sup>474

**Goatsucker**, bird family, 4-77

**Gobelin**, Jean, merchant dyer, 12-143

**Gobelin**, Philibert, merchant dyer, 12-143

**Gobelin looms**, tapestry making, 12-<sup>†</sup>139, <sup>\*</sup>142, 143-44

**Gobi Desert**, Asia, 5-336-B; 7-465

climate, 5-336-C

dust storms, 1-232

size; remains of prehistoric animals, 5-437

**Goblets**, glass, 12-<sup>\*</sup>32, <sup>\*</sup>33

**"Goblin Market,"** by Christina Rossetti, 13-256

**Goby**, fish, care of eggs and young, 3-210

**God**

Christian Science conception, 13-558

Greek philosophy, 13-6, 12

idea of one God, 5-64, 280

Ikhnoton's conception, 11-16

Jewish, Christian, and Mohammedan the same, 5-280

Jewish worship of, 5-119, 120, 131

Mohammedan religion, 5-423

names for, 5-119, 273

Yahweh, 5-119, 125

**"God Is Our Refuge,"** by Wolfgang Mozart, 12-<sup>\*</sup>267

**"God moves in a mysterious way,"** by William Cowper, 13-213

**Go-Daigo**, Japanese emperor, 5-350

**Goddard**, John, furniture by, 12-198

**Godfrey of Bouillon**, king of Jerusalem, 5-283

route of crusade, 5-<sup>\*</sup>296

**Gods**

African Negro, 5-<sup>†</sup>446

Babylonian, 5-87

Egyptian, 5-49, <sup>†</sup>54, 64, 69

fire, 10-334

Greek and Roman, *see* Greek and Roman mythology

Indian, 7-91, 92, 100

Japanese (Shinto), 5-345

Scandinavian, 6-<sup>†</sup>370, 376

**Gods—continued**

Sumerian, 11-404

Toltec, in Mexico, 7-69

**Godunov, Boris Feodorovitch**, czar of Russia, 6-428

**Godwin, Mary Wollstonecraft** (Mrs. Percy B. Shelley), 13-<sup>†</sup>229

**Godwin, William**, 13-229

**Godwits**, birds, 4-118

**Goebbels, Paul Joseph**, biography, 6-566

**Goeduck**, clam, 3-<sup>\*</sup>155, <sup>\*</sup>156

**Goemboes, Julius**, Hungarian premier, 6-290

**Goering, Hermann Wilhelm**, biography, 6-566  
war crimes trial, 6-<sup>\*</sup>241-A

**Goes, Hugo van der**, painting by, 11-203

**Goethals, George W.**, builds Panama Canal, 10-270; 7-307; 12-546

**Goethe, Cornelia**, 13-281

**Goethe, Johann Wolfgang von, life and works**,  
main article, 13-<sup>†</sup>280 83; portrait, 13-<sup>\*</sup>281

and Herder, 13-<sup>\*</sup>276, 277

and Schiller, 13-<sup>†</sup>279

correspondence with Carlyle, 13-236

"Faust," 13-<sup>†</sup>282, 283

monument to, Rome, 13-<sup>\*</sup>286

work for theater, 12-332; 13-283

**Goetz von Berlichingen**, *see* Berlichingen, Goetz von

**Gogebic iron district**, Michigan, 8 186-A

**Gogh, Vincent van**, paintings by, 11 <sup>†</sup>384-86

"The Postman Roulin," 11-2nd color plate following 360

**Going to Jerusalem**, game, 14-155

**Going-to-the-Sun Highway**, 8-220-A

**Goiter**, iodine a possible preventive of, 10-542

**Gold**, element, main article, 9-<sup>\*</sup>391-96

alchemist tries to make, 10-544

assaying, 9-<sup>\*</sup>395

carat, 9-396

density or specific gravity, 9-396

dredging, 9-394

element, 1-534

found in streams and rocks, 9-394

glass colored with, 12-31

green, 9-396

in Mohammedan art, 12-56

in mosaic work, 11-79; 12-112

malleability, 9-396, 12-80

measurement, 9-396

melting point, 1-<sup>\*</sup>392; 9-394

mining, 9-<sup>†</sup>393-95

money, amount in, 9-396

why used for, 7-506

panning, 7-<sup>\*</sup>556, <sup>\*</sup>238; 9-<sup>\*</sup>395

placer mining, 9-<sup>†</sup>393-95

plentiful in ancient Egypt, 5-12

prices affected by supply of, 7-513

producing regions, 9-392-93

Europe, 6-162-D

New Zealand, 5-538, 539

South America, 5-518-B

United States, 7-343-F

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Gold**, producing regions, U. S.—*continued*

California's production, 8-40; 9-393

Colorado, 8-48, \*49

Idaho, 8-88-89

Oregon, 8-328

Utah, 8-394

Wyoming, 8-451

*see also* Gold rushes

refining, 9-393, 394, \*395

rescued from sunken ship, 10-524

**shipment of**; international trade payments, 7-†510-14

statue of Athena made of ivory and, 12-84

substances mixed with; qualities, 9-396

symbol, atomic no. and wt., 1-\*551

United States put on gold basis, 12-456-10

uses, 9-394, 396

weighing of bars for shipping, 5-\*488

white, 9-396

why valuable, 9-396

woven into tapestries, 12-144

*see also* Goldsmithing and silversmithing**"Gold Bug, The,"** by Edgar Allan Poe, 13-315**Gold certificate**, 7-507**Gold Coast**, colony, W. Africa, description, 5-471

location, 5-476

map, 5-574

**Gold Diggers**, people of California, 8-42-B**"Gold Girl, The,"** painting by Whistler, 11-\*357**Gold leaf**, 12-80; 9-396**Gold paint**, child killed by, 2-293**Gold rushes**, 9-392-93

Alaska, 9-393; 8-13

Australia, 5-554

California, 9-393; 7-239; 8-38

Canada, 7-29-V

"fifty-niners," 7-\*276, 277

Colorado, 8-48

Nevada, 8-232

Oregon, 8-328

life pictured, 13-333; 9-\*392

Montana, 8-217

New York affected by, 8-277

South Africa, 5-486, \*488

South Dakota, 8-360, 361

**Gold Standard**, 7-507

abandoned by U. S. and Great Britain, 7-342

**Goldberger, Joseph**, study of pellagra, 2-364**Goldcrest**, wren, 4-173**"Golden Afternoon in Oregon,"** by Childe Hassam, 11-\*371**Golden Age of Pericles**, *see* Pericles, Age of**Golden apples**

in Hippomenes' race with Atalanta, 14-453

obtained by Hercules, 14-429

**Golden Bull**, granted by Hungarian king, 6-279**Golden carp** (goldfish), 3-\*241**"Golden Cockerel, The,"** opera by Rimsky-Korsakov, 12-313**Golden conure**, parrot, 4-\*190**Golden-crested penguin**, bird, 4-\*218**Golden-crested wren**, 4-173**Golden-crowned kinglet**, bird, 4-224, \*225  
similarity to gold-crest, 4-173**"Golden Days of Weimar, The,"** painting, 13-\*279**"Golden Dog, The,"** by William Kirby, 7-29-H**Golden eagle**, bird, 4-152**Golden Eaglet**, of Girl Scouts, 14-547**Golden-eye duck**, 4-119**Golden fleece**, 4-449

search for, 9-392

**Golden Gate**, 8-39**Golden Gate Bridge**, 10-\*214; 8-39

date completed, 8-43

**Golden Gate of Constantinople**, 5-\*404**"Golden Goose,"** fairy tale, text, 14-†205-6**"Golden Hind,"** Drake's ship, 12-403**Golden Horde** (Tatars)

China, 5-327

Kingdoms, 5-270

Russia, 6-426, 427

**Golden Hour, The,"** statue by Rudolph Evans, 11-\*373**"Golden Legend, The,"** by Arthur Sullivan, 12-320**"Golden Legend, The,"** lives of saints, 13-525**Golden mean**, Aristotle's doctrine of the, 13-10, 51**"Golden milestone,"** in Roman Forum, 10-151**Golden mole**, 4-278**Golden pheasant**, bird, 4-187, \*189**Golden plover**, bird, 4-115, 116**Golden poppy**, 8-42-B**Golden robin** (oriole), 4-28**Golden Rule**, 8-333**Golden Sea**, name for Pacific Ocean, 12-403**Golden thrush**, flicker, 4-\*71**Golden-winged woodpecker**, bird, *see* Flickers**Goldenrod**, flower, 2-\*173

Alabama's state flower, 8-8-A

Kentucky's state flower, 8-138-B

Nebraska's state flower, 8-228-A

rubber from, 9-263

**Goldfinch**, bird, 4-82, \*83, 172

Father Goldfinch feeding mate, 4-\*4

nest, 4-\*83

scientific name, 8-124-A

state bird of

Iowa, 8-124-A

Minnesota, 8-198-A

**Goldfish**, 3-\*241

aquarium, 14-2-4

how to care for, 14-4-5

**"Goldilocks and the Three Bears,"** fairy tale, text, 14-†225-26**Goldoni, Carlo**, attempt to reform "Commedia dell' Arte," 12-331**Goldsmith, Oliver**, life and works, main article, 13-†197-99

friend of Dr. Johnson, 13-\*192, \*194, 195

**Goldsmithing and silversmithing**, main article, 12-†70-92

church decoration, 12-86

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Goldsmithing and silversmithing—continued**

decoration and ornament, 12-80, 90

famous funeral effigy, 11-\*246

plating, 12-89, 90

styles

American, 12-†90, \*91

British, 12-\*87, \*89, 90

Byzantine, 12-\*85, 86, \*87

Egyptian, 12-79, \*80, 82

Etruscan, 5-\*192, †193; 12-\*82

French, 12-84, †86, 90

German, 12-90

Greek, 12-82, \*83

models of Renaissance, 12-88

Italian Renaissance, 12-\*79, \*85, 88

Japanese, 12-\*88

Mycenaean, 12-82

Roman, 12-\*82, 84

models of Renaissance, 9-88

Scandinavian, 12-90, 92

Sumerian, 12-79, \*81, 82

tools used, 12-80

*see also* Jewelry**Goldsmiths**

artists renowned as, 12-88

distinction between jewelers and, 12-80

Elgius, the patron saint of, 12-86

**Goldwin Smith Hall**, Cornell University, 8-\*265**Golf**, main article, 14-†494-98

clubs used in, 14-495

correct methods of play, 14-\*496-97

substance used for ball, 9-309

**Golf ball**, composition, 9-309**Golf museum**, first, 8-418-A**Golf widows**, 14-494**Goliath and David**, 5-\*122, 123

painting by Blake, 13-\*211

**Goliath beetles**, 3-340, \*342**Goliath heron**, bird, 4-\*103**Gómez, Juan Vicente**, 5-517**Gompers, Samuel**, labor organizer, 7-561

portrait, 7-\*335

**Gondola**, 11-\*487**"Gondoliers, The,"** by Gilbert and Sullivan, 12-320**Gondwanaland**, lost continent, 3-35; 5-444**Gonzaga, Vincenzo**, Duke of Mantua, Rubens in the service of, 11-220**Gonzaga family**, art patrons of Padua, 11-138**Gonzalez, Manuel**, president of Mexico, 7-86**Goo-goo theory** of language, 10-2**Goobar State**, nickname for Georgia, 8-84**Goobers**, *see* Peanuts**"Good Administration,"** painting, 12-\*571**"Good and Bad Government,"** frescoes of Ambrogio Lorenzetti, 11-120**"Good-bye and Keep Cold,"** poem by Frost, 13-349**"Good Deeds of David I,"** picture, 6-\*111**"Good fences make good neighbors,"** poem by Frost, 13-349**Good Friday**, 14-581**Good Gray Poet** (Walt Whitman), 13-327**Good Hope, Cape of**, promontory, South Africa, discovery; reason for name, 5-476

map, 5-577

ocean route, 10-238, 239

"Post Office Stones" at, 10-85

rounded by Diaz, 6-341; 7-113; 13-456

**"Good-Natured Man,"** by Oliver Goldsmith, 13-199**"Good Neighbor, The,"** foreign policy, 7-341-B

South America, 5-518; 6-\*528

**Good Queen Bess** (Elizabeth, queen of England), 6-51**Good Shepherd**, in art, 11-†74**Goodhue, Bertrand Grosvenor**, architect, 8-222**Goodridge, Sarah**, portrait by Gilbert Stuart, 11-\*355**"Goodspeed,"** ship, 7-121**Goodyear, Charles**

invents vulcanized rubber, 9-268, 271

portrait, 9-\*271

**Goodyear, Charles, Jr.**, invents shoe-making machine, 9-61**Goodyear Turned shoes**, 9-61, \*62**Goodyear Welt shoe**, 9-61, \*62, \*63**Goofa**, boat, 10-\*138**Goose, Canada**, 4-120, \*121, \*122, \*1

color plate, 4-\*120

**Goose barnacle**, 3-190, \*191**Goose flesh**, cause of, 2-293**"Goose Girl,"** fairy tale, text, 14-†235-38

color plate, 14-\*236

**Goose Lake**, U. S., 8-42**Gooseberry**, 9-156, 158**"Goosey, Goosey, Gander,"** nursery rhyme, text, color plate, 1-174-C**Gopher**, animal, 4-370, \*372, 379, \*380**"Gopher Prairie,"** village in Lewis's "Main Street," 13-350**Gopher State**, 8-198-A**Gopher tortoise**, 3-\*468, 469**Gophers**, nickname for people of Minnesota, 8-198-A**Gordian Knot**, cut by Alexander the Great, 12-348**Gordon, Charles George**, government of the Sudan, 5-455**Gordon, Frances**, Reynolds' model, 11-295**Gorgas, William C.**, 7-307**Gorge**, in physiography, 1-25**Gorges, Ferdinando, Sir**, in New World, 8-152

land grant, 8-156-A

**Gorges**, fishhooks of Old Stone Age, 5-29**Gorgons**, mythological sisters, 14-446**Gorgonzola**, cheese, 9-348**Gorham, Nathaniel**, 12-496**Gori**, Russia, 12-449-D**Gorillas**, apes, 4-†241-44, \*246**Gorki, Maxim**, recognizes Andreyev, 13-97**Gorm**, first king of Denmark, 6-409**Gortschakoff, Prince**, of Russia, at Congress of Berlin, 6-\*232

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Gosnold, Bartholomew**, English voyager, Cape Cod named by, 8-166
- "Gossip,"** painting by Carl Marr, 11-\*369
- Göta Canal**, Sweden, 6-407; 10-\*270
- Göteborg**, Sweden, 6-403  
linked to Stockholm by waterway, 10-259  
map, 6-597, 108
- Göteborg**, Sweden, *see* Göteborg
- Gothic architecture**, main article, 11-†459-78  
America, 11-512, 521  
arch, 11-462, \*463  
border ornament, 11-474  
buttresses, 11-\*463, 468  
compared with Greek, 11-459  
continental, 11-†459-70  
decoration, 11-†92-105  
England, 11-†472-78  
flamboyant style, 11-466  
flying buttresses, 11-\*463, 468  
French and English compared, 11-474  
Italy never completely won by, 11-107, 110  
origin of name, 11-460  
parliamentary Gothic, 6-\*78, \*277  
Perpendicular, 11-474  
stained glass windows, 11-100, \*101, 462, \*464; 12-76  
vaulting, 11-462, \*463
- Gothic art**, main article, 11-†92-105, 107, 110
- Gothic crafts**  
carving, 12-\*101  
furniture, 12-182  
stained glass, 11-100, \*101, 462, \*464; 12-76  
tapestry, 11-\*100, 103
- Goths**  
Byzantine empire, 5-289  
conquest of Europe, effect upon art, 11-83  
destruction by, in Italy, 5-\*252  
Europe, 6-424  
Italy invaded by, 6-293  
migrations, 5-268  
Rome captured by Ostrogoths, 13-58  
Rome captured by Visigoths, 5-254  
Spain, 6-319  
story of Visigoths, 5-253
- "Götterdämmerung,"** opera by Wagner, 12-296  
bass viol used in, 12-258
- Gottfried von Strassburg**, 6-211
- Gottland**, island, Baltic sea  
made part of Sweden, 6-395  
map, 6-597
- "Götz von Berlichingen,"** by Goethe, 13-281
- Goucher College**, Baltimore, Md., 8-162
- Gould, Jay**, 7-282
- Gounod, Charles François**, life and works, 12-307-8, 253  
portraits, 12-\*241, \*307
- Gourlay, Robert**, 7-17
- Government**, main article, 7-†345-59 (*see also* Contents Volume 7)  
business ownership, 7-544, 549  
by an oligarchy, 5-175
- Government—continued**  
communistic, of Inca Indians, 7-92; *see also* Communism  
controlled by nobility; Poland, 6-448  
dictatorships, 7-554  
divine right of kings, 7-353  
dualism; Austria-Hungary, 6-288  
"enlightened despotism," 6-264, 284  
feudal system, 5-†301-7, 293, 294, 311; 6-20; 7-351  
Germany, 6-207  
Japan, 5-347, 357  
importance of obeying the law, 12-530  
New Zealand's best in the world, 5-540  
self-government in Greece, 5-149  
socialistic, 7-549-52  
theory and history, 7-†345-59  
absolute rulers, 7-347, 350, 353  
constitutional government, 7-356-59  
direct primary referendum: initiative recall, 7-312  
division into legislative, executive, and judicial, 7-357-59  
hereditary rulers, 7-347  
monarchies, 7-347, 350, 352  
primitive, of clans and tribes, 7-†346  
representative government, 7-348, 353, 355-59  
responsible government, 7-15; 5-556  
science of, 7-401  
services to citizens, 7-359
- United States**, 7-†361-81  
cities, 7-†391-402  
counties, 7-386, 388, 389  
formation and admission of states to Union, 7-176  
states, 7-†383-89  
Wisconsin's innovations, 8-445  
*see also entries under* United States government; *also subhead* political facts *under each state*  
*see also entries under countries, as* Great Britain, government; Rome; etc.; *under political subdivisions, as* States, government; *and under forms of government, as* Communism; Democracy; Socialism
- Government bonds**, 7-529
- Government buildings**, *see* Washington, D. C.
- Government by Family Compact**, Canada group of Tories, 7-17
- Government control**  
monopolies, 7-543  
Russia, 6-443-B  
under dictatorships, 7-554  
Wisconsin, 8-445
- Government departments**, *see names of departments under* United States
- Government ownership**, 7-549
- Governor**, in steam engine, 10-†401
- Governors, district**, in rule of empires, 5-103
- Governors, state**, duties of, 7-347, 385; *see also subhead* political facts *under each state*

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

- Gower, John**, "Balade unto . . . Kynge Henry the Fourth," 14-466
- Goya, Francisco**, life and art, main article, 11-†306-9, 324  
 compared with Manet, 11-341  
 compared with Velasquez, 11-309  
 paintings  
   "Carnival," 11-\*307  
   Doña Isabel Corbo de Porcel, 11-\*308  
   self-portrait, 11-\*309  
   "The Third of May, 1808," 11-\*306
- Gozzoli, Benozzo**, paintings, 11-136, 138  
 painting of Wise Men and followers, 11-\*135
- Gracchus, Gaius**, Roman statesman, 5-\*216, 218
- Gracchus, Tiberius**, Roman statesman, 5-\*216, 218
- Graces, Three**, 14-411
- Gracilis*, defined, 2-184
- Grackle**, bird, 4-†90-91  
 color plate, 4-\*25  
 nest building and breeding, 4-\*90  
 rusty, 4-46  
*see also varieties, as* Bronzed grackle
- Gradualism**, in Economics, 7-551
- Graeeae**, mythological sisters, aid Persens, 14-446
- "**Graf Spee**," German pocket battleship, scuttled, 5-541-A; 6-504
- "**Graf Zeppelin**," radio service to, 10-118
- Grafting**, of plants, 2-†231
- Grafting of skin**, 2-288
- Grafton, R.**, "Great Bibles" printed by, 10-54
- Grafton, W. Va.**, industries, 8-436
- Graham, Sir Robert**, 6-118
- Graham Land**, Antarctica, maps, 13-503-A; 5-572
- Grail, Holy**, quest for, 14-393-98  
 Rossetti's painting, 14-\*394
- Grain**, fruit of grasses, 2-179  
 alcohol made from, 10-547  
 grain region of United States, 7-343-E  
 grains that are cereals, 9-†118-20  
 measure, 10-374  
 North Dakota's industry, 8-301  
 rusts, 2-140
- Grain**, unit of measure, 10-375
- Grain Coast**, Africa, 5-470
- Grain elevators**, 9-\*236  
 Port Arthur, Ontario, 7-\*26
- Gram**, measure, 10-377
- Gramophone**, invention of, 10-498
- Grampian Mountains**, Scotland, map, 6-574
- Grampus**, whale, 4-\*444
- Gran Chaco**, region, between Bolivia and Paraguay, So. Amer., 5-518-A  
 area, 5-518-G  
 dispute over, 5-510
- Gran Quivira National Monument**, 8-262-A
- Granada**, Spain  
 ironwork in cathedral, 12-\*7  
 Moors driven from, 6-322
- Granadilla**, tropical fruit, 9-196
- Granary**  
 at Madagascar, 5-\*447  
 of Mexican Indians, 13-\*470; 7-\*72
- Grand Alliance**, 6-219
- Grand Army of the Republic**, 7-\*257
- Grand Ball Room**, cave, Virginia, 1-\*87
- Grand Banks of Newfoundland**, fogs, 1-242; 10-234
- Grand Canal**, China, 10-264
- Grand Canary**, island, N. W. of Africa, 6-491  
 map, 5-574
- Grand Canyon**, Arizona, natural formation, 1-†46; 8-18-19; 7-419
- Grand Canyon National Monument**, 8-24
- Grand Canyon National Park**, Arizona, 7-409; 8-24
- Grand Cayman**, island, West Indies, 7-55
- Grand Coulee**, old river bed, Washington, 8-428  
 dam across, 8-428; 3-\*244; 10-531
- Grand Falls**, Labrador, 7-32
- Grand Forks**, N. D., 8-299  
 industries, 8-301
- Grand Geyser**, 7-406
- Grand Island**, city, Nebraska, industries, 8-226
- Grand Monarch**, title given Louis XIV, king of France, 13-114
- Grand Mufti**, game, 14-155
- "**Grand Old Man**," Gladstone, 12-\*442
- Grand piano**, 12-258-D
- Grand Prairie**, region in Texas, 8-386
- Grand Pré**, Nova Scotia, church, 7-\*29-K; 11-\*497
- Grand Rapids**, Mich., furniture industry, 8-184
- Grand River**, Iowa through Missouri, 8-212 A
- Grand River**, Labrador, *see* Hamilton River
- Grand River**, Mich., 8-186-A
- Grand River**, South Dakota, 8-364
- Grand Teton**, mountain peak, Wyoming, 7-406
- Grand Teton National Park**, Wyoming, 8-454-A; 7-406
- Grand Trunk Pacific**, railway, 7-28
- Grande Ronde**, river, Oregon, 8-331
- Grande Terre**, island, West Indies, 7-64
- "**Grandfather clause**" to limit negro vote, 7-274; 8-8
- Grandfather clock**, 12-\*195
- Grandson**, Battle of, 6-250
- Grange**, farmers' society, 7-291
- Granicus**, Battle of, 5-178, 12-348
- Granite**, rock, 1-52; 9-380  
 Maine quarries, 8-\*151, 154  
 New Hampshire, 8-\*239  
 structure, 3-2  
 used by Egyptian sculptors, 11-19
- Granite Boys**, 8-242-B
- Granite City** (Aberdeen, Scotland), 6-133
- Granite Peak**, in Montana, 8-216
- Granite State**, 8-242-A
- Granny knot**, 14-\*555
- Grant, Bryan M.**, tennis player, 14-464
- Grant, Hiram Ulysses**, *see* Grant, Ulysses Simpson

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

- Grant, Julia Dent** (Mrs. Ulysses S. Grant), 12-563  
     gown worn by, 9-<sup>\*</sup>15
- Grant, Nellie**, marriage, 12-563
- Grant, Ulysses Simpson**, president of the U. S.,  
     biography, main article, 12-<sup>†</sup>535-38, 456-C;  
     7-271  
     family, 12-<sup>\*</sup>537  
     in Civil War, 12-536-38; 7-260, <sup>\*</sup>261, 263, 265  
     Lee's surrender to, 7-265  
     loses nomination in 1880, 7-286  
     portrait, 7-<sup>\*</sup>271; 12-<sup>\*</sup>536  
     reasons for winning war, 12-526  
     scandals during administration, 7-281
- Grant**, territorial division, Maine, 8-156
- Grant Memorial**, Washington, 7-<sup>\*</sup>253
- Grant's zebra**, 4-<sup>\*</sup>351
- Grape fern**, 2-90
- Grape hyacinth**, 2-<sup>\*</sup>146
- Grape State**, 8-42-B
- Grape Vine Mts.**, Cal., 7-<sup>\*</sup>416
- Grapefruit**, 9-170, 173
- Grapes**, 9-<sup>\*</sup>165, <sup>\*</sup>167, 168  
     California industry, 8-<sup>\*</sup>35  
     fruit, 2-115  
     fungicide for, 2-139  
     leaf veins, 2-<sup>\*</sup>26  
     Oregon, 8-332  
     vine, 2-<sup>\*</sup>154  
     vine at Hampton Court, 9-<sup>\*</sup>165  
     water content of leaves, 2-259
- Grapevine dresser**, caterpillar, 3-290
- Graphite**  
     in pencil lead, 1-1  
     South America, 5-518-B
- Grapnel**, deep-sea cutting, 10-<sup>\*</sup>105
- Graptolites**, sea creatures  
     Devonian period, 3-24  
     Ordovician period, 3-13
- Grass**, color of, in Constable's paintings, 11-317, 325
- Grass huts**, 11-<sup>\*</sup>399; 8-457, <sup>\*</sup>458
- Grass parakeet**, 4-192
- Grass snakes**, 3-498
- Grass sponges**, 3-87
- Grass-stalk insects**, 3-354
- Grasse, François Joseph Paul de (Marquis de Grasse-Tilly)**, in American Revolution, 12-456
- Grasse, France**, perfume industry centered at, 9-302
- Grasses**, account of, main article, 2-<sup>†</sup>177-80  
     cereals, 9-<sup>†</sup>118-20  
     esparto grass, 9-290  
     flowers and stems, 2-145  
     in dry places, 2-197  
     indehiscent fruits, 2-122  
     Indian corn, 9-<sup>†</sup>104-6  
     monocotyledons, 2-<sup>†</sup>145  
     products, 2-180  
     soil benefits by, 7-466  
     sorghums, 9-<sup>†</sup>314
- Grasses**, account of—*continued*  
     stem of wheat, 2-<sup>\*</sup>31  
     sugar cane, 9-<sup>†</sup>113-16  
     wheat, 9-<sup>†</sup>97-102; color plate, <sup>\*</sup>96
- Grasshopper sparrow**, 4-85, <sup>\*</sup>86
- Grasshopper State**, 8-132
- Grasshoppers**, 3-<sup>†</sup>345 fol.  
     breathing, 2-334  
     giant, 3-<sup>\*</sup>274  
     Greek myth about, 14-442  
     how to tell from locusts, 3-348  
     Kansas scourge, 8-132
- Grasshoppers**, people of Kansas, 8-132
- Grasslands**, should not be grazed too close in dry regions, 7-470
- Grattan, Henry**, Irish leader, 6-156
- "Grave, The,"** by Robert Blair, Blake's engravings for, 13-212
- Grave rugs**, 12-148
- Gravel**, 1-40  
     in mountain formation, 1-22
- Gravel Island Bird Refuge**, 8-446-A
- Gravelines, Battle of**, 12-405
- Gravelotte, Battle of**, 6-<sup>\*</sup>216
- Graves**, *see* Burial of dead
- Gravitation**, physics, main article, 1-<sup>†</sup>299-304  
     comets controlled by, 1-163  
     effect of centrifugal force upon, 1-122, 136  
     effect upon tides, 1-134  
     force, laws, 1-112, 302  
     discovered by Newton, 1-14; 13-401  
     holds creation together, 1-2, 112  
     Galileo's experiments with falling bodies, 13-397, <sup>\*</sup>398  
     law of universal gravitation, 1-14  
     planets controlled by, 1-106  
     pull of heavenly bodies, 1-<sup>\*</sup>133, 134, <sup>\*</sup>135, 140
- Gravity**  
     and gravitation, difference between, 1-303  
     work performed by, 1-338
- Gravity, specific**, 1-<sup>†</sup>474
- Gravity system**, water brought by, 10-538
- Gray, Asa**, studies and work, main article, 13-412  
     portrait, 13-<sup>\*</sup>412
- Gray, Henry Peters**, "The Wages of War," 5-<sup>\*</sup>177
- Gray, Robert**, American sea captain, discovers Columbia River, 13-492
- Gray, Thomas**, biography, main article, 13-<sup>†</sup>202-4  
     portrait, 13-<sup>\*</sup>203
- Gray fox**, 4-304, <sup>\*</sup>306
- Gray kangaroo**, 4-460
- Gray Lock**, Indian chief, 8-400
- Gray matter**, anatomy, 2-<sup>†</sup>387, <sup>\*</sup>395, <sup>\*</sup>396
- Gray owl**, 4-<sup>\*</sup>167
- Gray parrot**, 4-192
- Gray rabbit** (wood hare), 4-386
- Gray seal**, 4-335
- Gray squirrel**, 4-<sup>†</sup>364, <sup>†</sup>365, 367
- Gray wolf**, *see* Timber wolf
- Grayling**, fish, 3-236

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Grays Harbor**, location, 8-428
- Grazing iron**, glass cutting with, 12-74
- Grazing lands**, U. S., 7-455
- Grease**, used in lamps, 10-388
- Great American Desert**, 8-390; 14-583
- Great Appalachian Valley**, 8-2, 249
- Alabama, 8-8
- Cumberland valley a part, 8-341
- Georgia, 8-80
- Great Valley part of, 8-418
- Valley of East Tennessee, 8-373
- Valley of Virginia part of, 8-411
- Great auk** (garefowl), bird, 4-†205
- Great Australian Bight**, Australia, map, 5-600
- Great Awakening**, Jonathan Edwards the father of, 13-291, 292
- Great Barrier Reef**, Australia, 1-57; 5-544
- formation, 3-\*97, 99
- map, 5-601
- sea creatures on, 3-\*91, 94, 139, \*153
- Great Basin**, plateau of North America, 7-343-D; 1-27; 8-230
- climate, 8-396
- drainage for rivers, 8-392
- dry farming, 7-456
- Oregon, 8-324, 331
- rainfall, 8-331
- Utah, 8-391
- Great Basin Province**, 8-396
- Great Bear (Ursa Major)**, constellation, 1-178
- star maps showing:
- Jan and Feb., 1-178-A
- July and August, 1-178-G
- March and April, 1-178-C
- May and June, 1-178-E, 178-F
- Nov. and Dec., 1-178-K
- Sept. and Oct., 1-178-I
- Great Bear Lake**, Canada, map, 7-592
- Port Radium on, 7-\*29-X
- Great bearded vulture**, 4-161
- Great bittern**, bird, 4-105
- Great Britain**, 6-108-B (*see* Contents Volume 6)
- Army
- uniforms, 6-\*102
- World War I officers, 6-\*105
- art, *see* British art
- boundary dispute with U. S., 8-153
- climate, 6-108-B; 1-225
- coinage, 9-396
- crafts, *see* British crafts
- dominions, definition of, 7-33-A
- government, 6-108-B
- flags, 14-573
- color plate, 14-following 570, no. 27
- government and politics, 6-108-B
- cabinet, 6-78
- constitution, 7-356, 357
- political parties, 6-95
- Labor party, 6-101, 108
- political wars between Whigs and Tories, 6-93
- prime minister, 7-358
- Great Britain**, government—*continued*
- reasons for widespread influence, 6-1
- Reform Bill of 1832, 6-94, 95
- supremacy of law established by Magna Charta, 7-353
- history, *see* England, history; *see also* Contents Volume 6
- interests in Alaska, 7-28; 8-12, 14
- Khyber Pass protected by, 5-433
- labor movement, 6-93, 95
- maps, 6-572, 570
- islands and empire, 6-\*107
- music and musicians, 12-216, †319
- madrigals, 12-220
- opera, 12-227, 256
- Navy
- battleship building, 7-483
- World War I officers, 6-\*105
- once a part of mainland, 1-70
- opium trade in China, 5-331
- Parliament, *see* Parliament, British
- people, 6-108-B
- physical features, 6-108-B
- possessions
- Africa, 5-473-B
- Asia, list, 5-336-D
- Australia, 5-546
- Europe
- Cyprus, 6-480
- Gibraltar, 6-342-A
- Malta, 6-477
- North America, list, 7-33-N
- South America, 5-518-B
- for further material see under names of the various possessions in index*
- products and industries
- coal, 9-438
- iron and steel production, 9-408
- shipbuilding, 10-220
- silk weaving, 9-38
- size; once a peninsula, 6-2
- tea drinking, 9-135
- trade blockade, 6-90, 91
- unity between ruler and people, 6-92
- see also* British Commonwealth of Nations; *and the British colonies and countries, as*
- Australia; England; Gold Coast
- Great Buddha**, statue, at Nara, Japan, 5-397
- Great Central State**, 8-302-A
- Great Central Valley**, Calif., 8-38
- products from, 8-40
- Great Central Valley Project**, 8-41
- Great chameleon**, 3-462
- Great Charter**, *see* Magna Charta
- Great circle sailing**, 10-233
- Great Commoner** (William Pitt the Elder), 6-81
- Great Dane**, dog, 4-\*490
- Great Dike**, Colorado, 1-\*38
- Great Dismal Swamp**, Virginia, *see* Dismal Swamp
- Great Divide**, *see* Continental Divide

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- "Great Divide, The," drama by Moody, 13-354  
 Great eagle owl, 4-168  
 "Great Eastern," ship, Atlantic cable laid by, 10-\*103, \*104, 106  
 Great Egg Harbor River, N. J., 8-252  
 Great Elector (Frederick William), 6-†217  
 Great Emancipator (Abraham Lincoln), 7-255  
 Great Exile of Jews, 5-†127  
 Great Falls, Montana, industries, 8-219  
 Great Fire of London, 6-70, †71  
 Great Geyser, Iceland, 1-32  
 Great Glen of Albin, *see* Glen More  
 "Great God Brown, The," drama by O'Neill, 13-354  
 Great Hall of Karnak, 5-68, 69; 11-\*411, 413  
 "Great Highway of the King and all his subjects," 10-200  
 Great horned owl, 5-167, \*165  
     color plate, 4 \*152  
 "Great House" of Egypt, 5-52  
 Great hummer, bird, 4-177  
 Great Hungarian Plain, Hungary, 6-290-B  
 Great Kanawha, *see* Kanawha  
 Great Karoo, or Karroo, region of Africa, 5-473-A  
 Great Lake trout, 3-235  
 Great Lakes, N. Amer., 10-266-67, 7-343-D  
     age, 1-92  
     agreement between United States and Canada not to maintain armed fleets on, 7-15  
     canals, 10-274  
     cheap transportation afforded by, 8-180  
     climate along shores, 8-446  
     ebb and flow of water, 1-134  
     exploration, 7-3  
     fisheries, 9-\*365, 366, 368  
     in Ice Age river valleys, 1-60  
     maps, 7-593, 595  
     part of world's busiest waterway, 10-267  
 Great Lakes region, fur trade, 8-305  
 "Great Meadow, The," novel by E. M. Roberts, 13-352  
 Great Meadows, battle at, 7-143  
 Great Miami River, Ohio, 8-312-A  
 Great Mogul, diamond, 9-430  
 Great Mogul, locomotive, 14-\*36  
 Great Mogul, title, 5-374  
 Great Mosque, Cordova, 6-\*321  
 Great Mosque, Mecca, 5-421, †422  
 Great Northern Railway, 10-190  
 Great Northern War, 6-405  
 Great Organ, 12-258-D  
 Great Pacificator (Henry Clay), 12-519  
 Great Pagoda, Suchow, China, 11-\*394  
 Great panda, animal, 4-322  
 Great Peedee River, *see* Peedee River  
 Great Plains, Canada, 7-29-L, 29-T, 33-A, 33-B  
 Great Plains region of United States, 7-343-C  
     Colorado, 8-47, 52-A  
     coal deposits, 8-50  
     Montana, 8-220  
     rainfall, 7-343-D  
     South Dakota, 8-358  
 Great Plains region of U. S.—*continued*  
     Texas, 8-377  
     Wyoming, 8-454  
 Great Protestation by House of Commons, 6-60  
 Great Pyramid (of Khufu) at Gizeh, 5-54, 185, \*186; 11-\*10, †409-10  
 "Great River," name for Mississippi River, 13-466  
 Great Salt Lake, Utah, 8-390, \*394  
     area, 8-396  
     buoyancy of water, 1-473  
     elevation, 8-396  
     first man to see (?), 8-392  
     map, 7-594  
     salt in, 1-†44; 9-†411  
 Great Salt Lake Desert, Utah, 8-391, 396  
 Great Salt Lake Trail, 8-393  
 Great Sand Dunes National Monument, 8-52-B  
 Great Sandy Desert, Oregon, 8-331  
 Great Sanhedrin, supreme council of Jews, 5-133  
 Great Slave Lake, Canada, map, 7-592  
 Great Smoky Mountains, range, North Carolina and Tennessee, 8-296, 373  
 Great Smoky Mountains National Park, North Carolina and Tennessee, 8-374, 296-A; 7-409  
 Great Sphinx, Gizeh, Egypt, 5-†55; 10-481; 11-10, \*413  
 Great Stone Face, 8-242-A  
 "Great Stone Face, The," by Nathaniel Hawthorne, 13-300; 8-236  
 "Great Testament," by François Villon, 13-105  
 "Great Train Robbery, The," early photoplay, 10-506  
 "Great Trek," South Africa, 5-481  
 Great Unknown (Sir Walter Scott), 13-222  
 Great Valley, U. S., 7-343-C; 5-518-A  
 Great Valley of California, dry farming, 7-456  
 Great Wall of China, 10-\*357  
     completion, 5-319, \*320  
 Great War, *see* World War I  
 Great Western Railway of England, 10-183  
 Greater Antilles, *see* Antilles, Greater  
 Greater University of North Carolina, 8-296  
 Greater yellowlegs, bird, 4-116, \*117  
 "Greatest Show on Earth," Barnum's circus, 12-†575-79  
 Greave, leg armor, 10-351  
 Grebes (hell-divers), birds, 4-110, \*107, \*108  
     loon related to, 4-122  
     nest, building and breeding, 4-\*107, 110  
 Grecian art, *see* Greece, art  
 Greco, El (Dominico Theotocopuli), paintings, 11-†243-47  
     paintings  
     portrait, 11-\*243  
     "St. Maurice and His Theban Legion," 11-\*245  
     "The Burial of Count Orgaz," 11-\*244  
 Greece, ancient country, Europe, **description and history**, main article, 5-†143-82

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Greece—continued**alphabet, *see* Greek alphabet

architecture, 11-†415-25

Acropolis, Athens; probable appearance of, 11-†419

Adam brothers copy Greek ornament, 12-†192, 194

capitals, 11-†416, \*425; 12-†94

border motifs, 11-†425

diagram of three Greek orders, 11-†418

Olympia, reconstruction, 5-†167

ornament, 11-†425; 12-†192, 194

Sparta; restoration of market place, 5-†176

temples, 11-†417-25

finest in Asia Minor, 5-185, \*186

pediment, 11-†40

*see also* Parthenon

theater of Dionysus, 5-†159

arms and armor, 10-351, \*352

art, 11-†31-58

aim of artists, 11-46

art style reflected in fashions and architecture, 11-288

Asiatic influence, 11-29

compared with Roman, 11-71

Cretan art, 11-†31-34

Dorian art, 11-34

effect of air and topography upon, 11-38

effect of democracy upon, 11-38

Hellenistic Age, 11-55

ideal of human beauty, 14-471

influence upon Roman art, 11-60, 61, 67; 12-180

painting, *see* Painting, Greek realism, 11-50sculpture, *see* Sculpture, Greek

sphinxes, carved, 12-†178

transitional period, 11-37

*see also* crafts *below*

astronomers, 1-103, 113, 169, 170, 177; 5-160, 172; 13-†2

astronomical observation, 1-146, 147

beliefs about world, 1-†101

calendar, 10-481

coins, 7-†502

costume, 5-110; 9-†6, 8, 12, 94; 12-103

sandals, 9-57

countries and colonies of, 5-150

crafts

bronze work, 12-†14 fol.

carving, 12-†94, \*101, 102, 103; 11-†40 42, \*52, \*54

enameling, 12-64

furniture, 12-†176, 178

gem carving, 12-†101, 103

glass, 12-†28

goldsmithery, 12-82, \*83, 84

ironwork, 12-2

jewelry, 12-103, †122, \*123; 11-†45

minor arts, 11-†37

mosaics, 12-110

**Greece, crafts—continued**pottery, *see* Pottery, Cretan and Greek vases, 12-46, †49 fol. 178

paintings on, 11-†35-36, \*49, 50

culture

Byzantine empire, 5-405, 409

Egypt and elsewhere, 5-180

influence upon Jews, 5-127, 129

influence upon Romans, 5-218, \*227, 229; 11-61

influence upon Spain, 6-318

scholarship carried to Europe, 5-412

education, 5-170

schools

Academy of Plato, 13-7

Lyceum of Aristotle, 13-9

subjects taught, 13-7

famous tyrants and kings, 5-159

flight of Greeks from Constantinople, 5-412

galleys, 10-163

genius of, reaches apex, 5-176

government, 7-348, 353

first to experiment in self-government, 5-149

jury court, 7-†347

history, 5-†143-82

to 600 B. C., 5-†148-55

origin of peoples, 5-150, 152

beginning of history, 5-143

migration of Achaeans into, 5-152

early life under kings, 5-152

city-states, 5-153, 175

founding of colonies, 6-165, 318; 5-404

**Persian Wars**, 5-†157-64, 12-338 39

Age of the Tyrants, 5-157, 160

Persian invasions, 5-160, †162-64

ostracism of leaders, 5-160, 161

to 404 B. C., 5-†166-73

rise of Athens, 5-166

democracy in Greek states, 5-167, 172

during Age of Pericles, 5-†168-73

decline of Athens, 5-173

after 404 B. C., 5-†175-82

under Spartan oligarchs: Corinthian Way, 5-175

Xenophon and the famous ten thousand, 5-177

migrations of peoples to their lands, 5-180

conquest of, by Macedon, 5-177; 12-347

rule in Egypt, 5-72

invasion of India, 5-370

war with Etruria, 5-192

Roman and Turkish conquests of; later invasions, 5-182

war with Rome, 5-206

under Roman rule, 5-217, 218

ideal of womanly virtue, 14-453

influx of barbarians, 11-34

iron

knowledge passed on to Romans, 12-4

prized for beauty, 12-3

language and literature, *see* Greek language, Greek literature

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Greece —continued**

- law, early codes, 5-158
- life in, 5-170
- love of nature, 14-413
- map, 5-150
- masks worn in dramas, 12-324, 325; 13-\*38
- medicine
  - science of, originated in, 13-357
  - theory about lungs, 2-333
- mercenaries, 5-177
- music, 5-158, 159
  - first operas an imitation of, 12-223
  - instruments, 12-206, \*226, \*239
  - scales and modes, 12-206-8, 211, 215
- navy, 5-163, 168, 169, 172, 173; 10-163 12-339
- New Year's Day, 14-578
- numerals, 10-421
- Olympic games, 5-143, 154, 167; 14-471
- once joined to mainland, 3-61
- papyrus used for writing, 9-273
- Pausanias' "Description of Greece," 5-19
- philosophers and scientists**, 13-†1-12; 5-160, 172; 12-346
  - greatest thinkers of history, 5-149; 13-1
  - theories about polar regions, 13-493, 503
  - theories of matter, 1-533, 540, 541
  - see also names of philosophers, as Aristotle; Sophocles*
- physical features; effect on people, 5-\*150, 151; 11-38
- physical training, 5-170
  - Olympic games, 5-154; 14-471
  - Spartan youth, 5-155
- progress: wealth, 5-158
- racial classification, 5-44
- racial origin of people, 5-150, 152
- religion, 5-\*148, 153, 154; 14-406, *see also*
  - Greek and Roman mythology
- runners: fame of Pheidippides, 10-30
- shelter, houses, 5-170; 12-178
- slavery, 7-348
- Spartan life and character, 5-154
- trade, 5-158
  - Age of Pericles, 5-168
  - barbarians, 6-424
  - Egypt, 5-70
- widespread distribution of people, 5-150, 155
- writing learned from Phoenicians, 5-153
- see also* Athens; Greece, modern; Sparta
- Greece, modern country, Europe**, 6-368-B, \*550
- agriculture, 6-368-B
- archaeological discoveries in, 5-†10, †17-18, †19-20
- area, 6-368-B
- becomes a republic, 5-182
- climate, 6-368-B
- costume, 9-\*2
- effect of geography on, 1-24; 6-368-B
- flag, color plate, 14-following 570, no. 28
- government, 6-368-B
- fascist influence, 6-241
- location, 6-368-B

**Greece —continued**

- maps, 6-595, 571
- Mediterranean islands, 6-477, 478, 480
- merchant marine, number of, 10-232
- monarchy restored, 5-182
- people, 6-368-B
- physical features, 6-368-B
- provinces, 6-368-B
- rivers, 10-259
- sets up dictatorship, 5-182
- sports and games
  - Marathon race, 14-474
  - Olympic games, 14-471, 475
- tobacco, 9-223
- wins freedom from Turkey, 5-182, 414
- World War II, 5-182; 6-516, 519, 544
- "Greece, Description of," by Pausanias, 5-19
- Greek alphabet**, 5-112; 10-42, †44, 45
- Greek and Roman mythology**, main article, 14-†405-55 (*see also* Contents Volume 14)
  - abodes of the dead, 14-424
  - conception of earth, 1-†101, 102
  - constellations, 14-†425-32; 1-178
  - flying stories, 10-†313-14; 11-415
- Gods and goddesses of Olympus**, 14-†406-12, †422-24; 1-75; 5-150; 11-\*420, 422, \*423, 425
- Greek myths taken over by Romans, 5-204
- monsters, 14-†419-21 443-48
- nature deities, 14-433-36, †437-42
- origin of fire, 14-421-22
- origin of seasons, 14-†413-18
- picture weaving, 12-140
- planet names derived from, 1-109, 147, 154, 155, 158
- quest of the Golden Fleece, 9-388
- relations between gods and mortals**, 14-†449-61
- see also names of deities and other mythological characters, as Apollo; Daedalus; Proserpina*
- Greek architecture**, *see* Greece, architecture
- Greek art**, *see* Greece, art
- Greek chorus**, 12-324, 325
- Greek crafts**, *see* Greece, crafts
- Greek fire**, 5-406
- Greek language**
  - alphabet, 5-112; 1-177; 10-42, †44, 45
  - becomes the international language during the Hellenistic Age, 5-181
  - on Rosetta Stone, 10-\*41, 43
- Greek literature**, 5-159, 172
  - biographies, 13-†27 44
  - Aeschylus, 13-†32-34
  - Aesop, 13-†41-43
  - Aristophanes, 13-†39-40
  - Euripides, 13-†36-38
  - Homer, 13-†27-30
  - Plutarch, 13-†43-44
  - Sappho, 13-†30-32
  - Sophocles, 13-†35-36

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Greek literature—continued**

*see also names of Greek writers in index, as*

Aeschylus; Aesop

drama, 12-324; 13-33

Aeschylus the father of, 13-33-34

annual contest, Athens, 13-34, 35, 37

innovations of Sophocles, 13-36

theaters, 5-†159

**Greek mythology**, *see* Greek and Roman mythology

**Greek Orthodox church**, 5-275, 407

Bolshevist war against, 6-439, \*442

established in Russia, 6-425, 428, 430

Europe, today, 6-162-D

how it differs from Roman Catholic church, 4-407, 408; 5-275

**Greek philosophers and scientists**, *see* Greece, philosophers and scientists

**Greeley, Horace**

influence, 7-242

presidential nomination, 7-274

**Greeley, Colorado**, 8-52

**Greely, Adolphus, W.**, 13-499

**Green, Paul**, "In Abraham's Bosom" by, 13-355

**Green, Roger**, early Carolina settler, 8-287

**Green**, color, color plate, 1-434, 440

coloring matter in plants, *see* Chlorophyll

ink, 9-307; 12-157

on spinning disk, 1-†439

pigment, 1-440

**Green**, golf, 14-495

**Green Bay**, part of Lake Michigan extending

into Wisconsin, 8-446

**Green Bay, Wis.**, city

manufacturing, 8-444

port for early settlers, 8-440

**Green Bay Bird Refuge**, Wis., 8-446-A

**Green County**, Wisconsin, dairying, 8-444

**Green Cove Spring**, medicinal spring, Florida, 8-76

**Green gold**, 9-392

**Green Grotto**, Capri, 1-87; 6-\*480

**Green heron**, 4-\*101, 107

Florida, 8-76-A

**Green locust**, 3-\*346

**Green Mosque**, Brussa, tilework, 12-56

**Green Mountain Boys**, 12-495; 8-401

**Green Mountain Boys**, nickname for people of Vermont, 8-404

**Green Mountain State**, nickname for Vermont, 8-404

**Green Mountains**, range of Appalachians, 8-404

name, 8-404

"**Green Pastures, The**," negro play by Marc Connelly, 13-355

**Green River**, Kentucky, 8-138-A

sink hole, 1-85

**Green River**, Wyoming and Utah, 8-454

**Green snake**, 3-502

**Green-stick fracture** of bone, 2-321

**Green tea**, 9-136

**Green turtle**, 3-†478

**Green-winged teals, ducks**, color plate, 4-\*120

**Green woodpecker**, 4-174

**Greenback party**, 7-292

**Greenbacks**, U. S. currency, 7-292

**Greene, Francis Vinton**, 8-464

**Greene, Mrs. Nathanael**, Eli Whitney at home of, 10-406

**Greene, Nathanael, General**

opinion of Kosciusko, 12-455

prevents uniting of British armies, 8-292

**Greeneville, Tenn.**, Andrew Johnson's house, 7-\*268

**Greenfinch**, bird, 4-172

**Greenfork Top**, hill, Indiana, 8-116

**Greenhouse**, for plant growth, 1-\*345, 347

**Greenland**, island, No. Amer., description and history, 6-†482-84; *see also* index World War II, 6-493

discovery of, 13-495; 7-110, \*111

Eskimos, 6-482, †483, †484

ice and icebergs, 1-61, 63; 3-59

maps, 7-590; 13-502-A; 5-572

meteorite found in, 1-165, \*166

Peary's trips to, 13-500

tribute to Norway, 6-386

viking colony, 10-166

**Greenland bowhead**, whale, 4-447

**Greenland Sea**, Arctic Ocean, maps, 13-502-A; 5-572

**Greenland seal**, 4-334

**Greenland shark**, 3-198

**Greensboro, N. C.**, military park, 8-296-A

**Greenwich**, England, east and west measured from, 10-†470-73

**Greenwich meridian**, recognized as first meridian, 12-456-B

**Greenwich time**, 10-†470-73

**Greenwood Lake**, New York and New Jersey, 8-252

**Gregorian calendar**, 10-482

**Gregorian chants**, 12-212

**Gregory I, Saint** (the Great), pope, 6-294

desire to Christianize Angles, 6-9

rules for church music, 12-212

**Gregory VII** (Hildebrand), pope, 6-295

and Henry IV, 5-295; 6-\*295, 296

**Gregory IX**, pope, and Frederick II, 5-299

**Gregory XIII**, pope, improves calendar, 10-482

**Gregory, Isabella Augusta** (Lady), 6-161

**Gregory, Thomas W.**, in Wilson's cabinet, 12-549

**Gregory of Tours, Saint**, 5-291

**Grenada**, British West Indies, 7-66

**Grenadines**, islands, West Indies, 7-66

**Grendel**, in Beowulf legend, 14-319

mother of, 14-†321

**Grenville, George**, program for American colonies, 7-160

**Grenville, Sir Richard**, Roanoke Island settled by, 13-479

**Greta Hall**, near Keswick, England, home of Robert Southey, 13-\*219

The asterisk (\*) refers to picture and its explanation only. Theobelisk (†) refers to illustrated text.

- Gretchen**, in Goethe's "Faust," 13-282  
**"Grethel, Hansel and,"** fairy tale, text, 14-†196-98
- Greuze, Jean Baptiste**, paintings, 11-283, \*285  
 paintings  
   "Innocence," 11-285  
   "Study of a Young Girl's Head," 11-285  
   "The Father's Curse, 11-285
- Grévy's zebra**, 4-351
- Grey, Sir George**  
 governor of Cape Colony, 5-485  
 governor of New Zealand, 5-537, 538, 540
- Grey, Lady Jane**, 6-†47
- Greyhounds**, 4-490, 503
- Greylock, Mount**, in Berkshires, 8-176-A
- Greysolan, Daniel**, *see* Libut
- Gridley, C. V.**, 12-540
- Gridley Mountain**, Conn., elevation, 8-62
- "Grief,"** sculpture by St. Gaudens, 11-352, 364
- Grieg, Edward**, life and works, main article, 12-256, 303-4  
 portraits, 12-241, \*303
- Grieg, Nina Hagerup** (Frau Edward Grieg), 12-304
- Griffenfeld, Peder**, Count, chancellor of Denmark, 6-415
- Griffith, Clyde**, character in Dreiser's novel, 13-347
- Griffith, David Wark**, American moving picture director, 10-506, 507
- "Griffon,"** La Salle's ship, 7-34
- Griffon vulture**, 4-11, \*160
- Grigamore, Sir**, in Arthurian romance, 14-392
- Grijalva, Juan de**, expedition to Mexico, 7-73
- Grilles**, iron, 12-5-7, 8, 10
- Grilse**, young salmon, 3-249
- Grimacing monkeys**, 4-†252-54
- Grimaldi race**, 5-28
- Grimm, Jacob**, life and work, main article, 13-283-85  
 language studies, 10-6  
 portrait, 13-284
- Grimm, Wilhelm**, life and work, main article, 13-283-85  
 portrait, 13-284
- Grimm's Fairy Tales**, 13-283, 285
- Grimm's Law**, philology, 13-284; 10-6
- Griqualand**, dist., So. Africa, diamonds, 5-485
- Grisaille** of stained glass, 12-76
- Griset monkey**, 4-253
- Grisons**, canton, Switzerland, 6-252, \*254-A
- Gristle**, bones made of, 2-320, 323
- Gristmills**, 9-†233 35
- Grizzly bears**, 4-†313-15, \*318  
 Alaskan preserve, 8-16-A
- Groningen**, Holland, 6-353
- Gros, Antoine Jean**, baron, art style, 11-288, 290  
 "The Pesthouse at Jaffa," painting, 11-288, 290
- Gros point** (heavy stitch), lace, 12-166
- Grosbeaks** (finches), birds, 4-83, †84, 133  
 color plate, 4-89  
 nest building and breeding, 4-83, \*84
- Groseilliers, Medard Chouart des**, explorations, 7-139  
 Minnesota, 8-191
- Gross-Glockner**, mountain, Austria, 6-265
- Gross profit**, 7-533
- Grotefend, Georg Friedrich**, 5-104
- Grotesques**, architecture, 11-452  
 gargoyles, 11-†98-99
- Grotius, Hugo**, 13-168
- Groton, Mass.**, boys' school at, 12-555-B
- Grottoes**, *see* Caves and grottoes
- Ground**  
 conduction of electricity, 1-514  
 conduction of sound, 1-446
- Ground beetle**, 3-334
- Ground-controlled approach**, radar, 1-567
- Ground dove**, 4-†144, 146
- Ground hog** (woodchuck), 4-371, †372
- Ground Hog Day**, February second, 1-267 4-371
- Ground laurel**, or **mayflower**, state flower of Massachusetts, 8-176-B
- Ground nuts** (peanuts), 9-199
- Ground pine**, fern ally, 2-92
- Ground squirrel**, 4-†369-70
- Groundhog State**, nickname for Mississippi, 8-206-A
- Group of Seven**, Canadian artists, 7-29-11  
 paintings, color plate, 7-29-1  
*see* Thomson, Tom
- Group photographs**, by Dutch painters, 11-261, 264, \*272, \*275
- Grouper**, fish, 3-109
- Grouse**, bird, 4-†77, 78, 229
- Grove**, orange, 7-460
- Grover, William O.**, 10-444
- Growing season** of plants, 2-211, 256
- Growth**  
 animals and plants compared, 2-10  
 bones, 2-324  
 excurrent, of evergreens, 2-97  
 plant and animal compared, 2-10  
*see also* Cell division
- Growth ring**, botany, 2-28, †29  
 in fossil trees, 3-5
- Gruet**, watches made by, 10-468
- Grünwald, Mathias**, paintings by, 11-†207
- Grünwald, Battle**, of, 6-448
- Grunting ox**, 4-394, 396
- Gruyère cheese**, 9-348
- Guacamole**, a desert, 9-194
- Guadalquivir**, river of Spain, flowing into the Atlantic, 10-259; 6-342-B  
 map, 6-590
- Guadalupe. Our Lady of**, legend, 7-81
- Guadalupe Hidalgo, Treaty of**, 7-84
- Guadalupe Mountains**, Texas, Capitan Mountain in, 8-377
- Guadalupe Peak**, Texas, height, 8-386
- Guadalupe River**, Texas, 8-386

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Guadeloupe**, island, West Indies, 7-64  
**Guam**, island, Pacific Ocean, 5-528  
bread fruit, 9-212  
history: life on, 8-464-66  
map, 5-597  
ownership, 5-522  
**Guanacos**, animals, 4-\*399, 400  
**Guanajuato**, city, Mexico, 7-82  
silver mine near, 9-388  
**Guanajuato**, state, Mexico, map, 7-597  
**Guanches**, Canary islanders, 6-491  
**Guantánamo**, Cuba, rented by U. S., 7-60  
**Guarani**, Indian language, 5-518-G  
**Guard cells**, of plants, 2-26, 52  
**"Guardian,"** Steele's periodical, 13-182  
**Guardians of the Door**, Chinese, 5-325  
**Guarneri family**, violin makers, 12-224, 258  
**Guatemala**, country, Cent. America, 7-41 fol.;  
general data, 7-48-A  
area, 7-48-A  
climate, 7-48-A  
emblem, 7-45  
flag, color plate, 14-following 570, no. 29  
government, 7-48-A  
location, 7-48-A  
map, 7-598  
Maya Indians, 7-\*42, 44, 90  
people, 7-48-A  
physical features, 7-48-A  
rivers and streams, 7-48-A  
trade: chicle, 9-292  
transportation, 7-\*43  
**Guatemala City**, capital of Guatemala, 7-44  
**Guatemozin**, Aztec emperor, and Cortes, 7-76  
**Guava**, tropical fruit, 9-196  
**Guayaquil**, Ecuador  
location by Lat. and Long., 5-518-F  
rainfall and temperature, 5-518-F  
**Guaymas**, Mexico, temperature, 7-87-B  
**Guayule bush**, rubber from, 9-263; 7-87-B  
**Gudea**, Babylonian king, statue, 11-†25  
**Gudrun**, queen, in "Volsunga Saga," 14-310  
**Guelphs**, political faction, 6-297, 298  
origin, 5-298  
struggle with Ghibellines, 5-298, 299; 6-209  
territory of, in Germany, 5-\*293  
**Guenon**, monkey, 4-†252-54  
**Guereza**, monkey, 4-254  
**Guericke, Otto von**  
demonstration of air pressure, 1-\*452, 453  
invents static electricity machine, 1-†494  
**Guerrilla warfare**, 5-489  
**Guernsey**, island, English Channel, 6-488  
map, 6-578  
**Guernsey County**, Ohio, coal mining, 8-311  
**Guernsey cattle**, 9-332, \*333; 6-488  
**Guerrero**, state, Mexico, map, 7-597  
**Guesclin, Bertrand du**, *see* Du Guesclin, Ber-  
trand  
**Guessing contest**, game, 14-158  
**Guessing rhymes**, game, 14-163  
**Guiana**, region, So. Amer., 5-479, 500, 512; *see*  
also British Guiana; Dutch Guiana;  
French Guiana  
**Guiana Highlands**, or **Guiana Highland Pla-**  
**teau**, 5-518-A, 518-E  
**"Guide to American Battlefields in Europe,"**  
by Dwight D. Eisenhower, 12-555-F  
**Guided missile**, 10-368-F, \*365  
**Guido of Arezzo**, 12-213  
**Guido Reni**, *see* Reni  
**Guidoriccio of Foligno**, Martini's painting of,  
11-\*119, 120  
**Guilds**, 5-310  
England, 6-53  
Flemish artists ruled by, 11-196  
glassworkers, 12-27  
Italy, 6-297  
masons, 11-468  
merchant, 6-348  
metal workers, 12-6  
miracle plays, 12-327  
musicians, 12-217  
parades, 14-585  
tapestry weavers, 12-141  
trumpeters', 12-258-B  
**Guilford Courthouse, Battle of**, 8-292  
park commemorating, 8-296-A  
**Guillemots**, birds, 4-200, 204  
**Guinea**, region, W. Africa, description, 5-466,  
470-73  
gold and ivory trade, 13-456  
map, 5-574  
slave trade, 5-470  
*see also* French Guinea  
**Guinea, Gulf of**, Africa, maps, 5-574, 573  
**Guinea fowls**, 9-\*353, 359  
**Guinea pigs**, experiments with, 2-\*390, 13-414  
**Guinevere**, Arthur's queen  
condemned to death, 14-400  
last days, 14-404  
loved by Lancelot, 14-382, 394, \*401  
**Guise, Francis of Lorraine**, second duke of  
murder, 6-177  
victories, 6-†173  
**Guise, Henry of Lorraine**, third duke of, seeks  
French throne; assassination, 6-†177  
**Guitar**, musical instrument, 12-258-D; 1-449  
ukulele, 12-258-E  
**Guiteau, Charles J.**, assassin of Garfield, 12-  
456-C  
**Guizot, François Pierre Guillaume**, French  
statesman, 6-198  
**Gujarati**, language, 13-580  
**Gulf coastal plain**, 7-343-C  
Alabama, 8-8  
Mississippi embayment, 8-206  
**Gulf cotton**, 9-32  
**Gulf of Mexico**, *see* Mexico, Gulf of  
**Gulf State**, nickname for Florida, 8-76-A  
**Gulf Stream**, current, Atlantic Ocean, 1-67,  
211, \*223, 225

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Gulf Stream--continued**

- convection current in ocean, 1-399
- effect on climate, 1-223, 225
- "**Gulf Stream, The**," painting by Winslow Homer, 11-368
- Gulf weed**, alga, 2-69
- Gulfport**, Miss.; harbor, 8-205
- Gullet**, food passage, contraction in, 2-354
- "**Gulliver's Travels**," by Jonathan Swift, 14-343-52; 13-180
- Gulls**, birds, 4-†200-3, †204
  - in Oligocene, period, 3-52
  - monument to, 3-†368
  - nest building and breeding, 4-203
  - sanctuary for, 4-517
- Gully**, 7-\*467, \*468, 469
- Gum**, basketwork coated with, 12-131
- Gum arabic**, 9-307
- Gum senegal**, 9-307
- Gumla chick lobster**, 3-\*187
- Gumwood**, 5-544, \*548, 560 J
- Guncotton**, 10-417, 552
- Gunflints**, people of Rhode Island, 8-347
- Gunhild**, queen of Eric Blood Axe, king of Norway, 6-380, 381
- Gunnison River**, Colorado, 8-52 A
- Gunpowder**, 10-416
  - potash used in, 1-97
  - smokeless, 10-360, 417
  - war and weapons after invention of, 10-†348, 358-68-F
- Gunpowder Plot**, 6-\*59, \*60, 62
- Gunpowder River**, Maryland, length, 8-162-A
- Guns**, 10-349-68-F, 7-478
  - on warships, 7-483
  - toy, how to make, 14-†32, †35
  - see also* Cannon
- Gunther**, king, in "Nibelungenlied," 14-311
- "**Guntram**," by Richard Strauss, 12-316
- Gunwale** of a boat, 14-531, 532
- Gupta emperors**, India, 5-372
- Gurkhas**, people of Nepal, 5-441
- Gurnard**, fish, 3-211, color plate, \*199

- Gurney, Goldsworthy**, steam carriage made by, 10-\*178, 277
- Gusher**, oil, 9-454; 8-\*307
- Gustavus I (Gustavus Vasa)**, king of Sweden
  - leads rebellion against Denmark, 6-397
  - reign, 6-\*397, 398
- Gustavus II (Gustavus Adolphus)**, king of Sweden, life; character, main article, 12-†402; 6-400, 403
  - Goteborg founded by, 6-403
  - in 'Thirty Years' War, 6-214, 400
- Gustavus III**, king of Sweden, 6-406
- Gustavus IV**, king of Sweden, 6-407
- Gustavus V**, king of Sweden, 6-407
- Gutenberg, Johann**
  - Bibles printed by, 10-\*48, 50
  - movable type invented by, 10-48
  - printing press, 10-\*48
- Guthrum**, Danish leader, 6-\*12
- Gutta (taban) tree**, 9-309
- Gutta-percha**, source; uses, 9-309
- Guttiae**, an hitecture, 11-\*419
- "**Guy**," origin and meanings of term, 10-20
- Guy Fawkes Day**, 6-60
- "**Guy Mannering**," by Scott, 13-222
- Guyot**, Mount, peak between N. C. and Tenn., 8-296
- "**Guzla, La**," by Prosper Mérimée, 13-131
- Gwyn, Nell**, 9-\*18; 12-327
- Gwynedd**, state, Wales, revolt against England, 6-139
- Gyda**, queen of Harald Fairhair, 6-379
- Gymnasium**, how to make, 14-†46
- Gymnastic exercises**, 2-415, †416
- Gymnosperms**, plants, 2-95, 125
- Gypsies**, history; mode of living, main article, 5-†389-92
  - gypsy girl, 6-\*330
- Gypsum**, mineral, 9-384
  - deposits in New Mexico, 8-262-A
  - plaster of Paris made from, 1-54
- Gyrfalcon**, bird, 4-\*153
- Gyrocompass**, 1-\*291; 10-457
- Gyroscope**, spinning, 1-†291



- Haakon I**, the Good, king of Norway, 6-380
- Haakon IV**, the Old, king of Norway, reign 6-386
  - Iceland subjected by, 6-419
  - rescued by Birchlegs, 6-\*379
- Haakon V**, king of Norway, defeated by Scots, 6-\*112
- Haakon VI**, king of Norway, marries Margaret of Denmark, 6-411
- Haakon VII**, king of Norway, 6-390
- Haakon**, earl of Norway, 6-409
- Haakon, Longlegs**, king of Norway, 6-386

- "**Haarlem**," Dutch ship, wrecked in Table Bay, 5-477
- Haarlem**, Holland, center of bulb trade, 6-354
- Haarlemmer polder**, 6-355-A
- Haber, Fritz**, scientist, 10-546
- Habitants**, French Canadian peasants, 7-11
- Habitations of animals**
  - beaver lodge, 4-373, \*375
  - prairie dog towns, 4-†370-71
  - underground tunnels, 4-†277, 369
  - see also* Nest building; Rookeries

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Habits**, good, important for personal safety, 2-427, 428-30
- Hackee**, ground squirrel, 4-†370
- Hackensack River**, N. Y. and N. J., 8-252
- Hackney**, horse, 4-†511
- Hackworth's locomotive**, 10-†180
- Haddock**, fish, 9-366
- Haden**, Sir Seymour, 10-64
- Hades**, mythology, 14-407, 424
- Hadramaut**, region, Arabia, map, 5-580
- Hadrian**, emperor of Rome, 5-†240, 241  
taught by Plutarch, 13-43  
tomb, 5-241: 11-†437
- Hadrian IV**, pope, and Frederick I, 5-295
- Hadrian's Wall**, Great Britain, 6-†3, 5
- Haematein**, black dye derived from, 9-306
- Haemoglobin** in blood, 2-338, 345
- Haemophilia**, disease, *see* Bleeders
- Hafnium**, element, 10-494  
discovered by X ray, 10-494  
symbol, atomic no. and wt., 1-†551
- Hagar and Ishmael**, graves of, in Mecca, 5-422
- "Hagar and Ishmael,"** painting by Benjamin West, 11-†355
- Hagen**, character in "Nibelungenlied," 14-311, †316
- Hagerstown**, Md., industries, 8-161
- Hagerstown Valley**, Md., 8-162
- Hagerup**, Nina (Frau Edward Grieg), 12-304
- Hague**, The, Holland, description, 6-355  
conference on limitations of armaments, 7-301  
Permanent Court of Arbitration, 12-†565
- Hague Peace Palace**, 12-†565
- Hague Tribunal**, established, 7-301
- Haida Indians**, 7-†98
- Hail**, frozen vapor, 1-†249  
cause, 1-407
- "Hail! Minnesota,"** song, 8-198-A
- Haile Selassie I**, emperor of Ethiopia, 5-460
- Hainan**, island, South China Sea, map, 5-591  
occupied by Japan, 5-364
- Hair**, animal  
alpaca, 4-399  
camel, 12-156  
goat, 12-156  
mammals, 3-68  
spider, 3-411  
uses  
cloth, 12-156  
felt, 9-89
- Hair**, human, 2-†290  
care of, 2-421  
formed from skin, 2-289, 290  
kinds, 2-290  
nose and other air passages, 2-336  
papillae, 2-†290  
pigment, 2-290, 345  
scalp, 2-†288  
sense of touch, 2-292  
structure, 2-289, 2-290
- Hair cells**, sensory  
ear, 2-282, 283, 305  
tongue, 2-307
- Hair seals**, 4-331, †332
- Hairdressing styles**  
New Guinea, 9-†5  
West African, 9-†4  
wigs, 9-20  
*see also* Headdresses of many lands
- Hairs**, of plant  
dusty miller plant, 2-†45  
sweet-potato flower, 2-172
- Hairstreak butterfly**, 3-282
- Hairy-cap**, moss, 2-85
- Hairy-eared bear**, 4-†319
- Hairy mammoth**, fossil found in Siberia, 3-†4, 5
- Hairy woodpecker**, 4-†12, †68
- Haiti**, island, West Indies, description and history, 7-†56-58; 54-A  
Columbus' settlement on, 13-450, 452, 455  
discovery, 13-450  
map, 7-601  
pirates, 10-170
- Haiti**, republic, island of Haiti, description and history, 7-57; general data, 7-54-A  
area, 7-54-A  
climate, 7-54-A  
flag, color plate, 14-following 570, no. 30  
government, 7-54-A, †374  
location, 7-54-A  
map, 7-601  
people, 7-54-A  
physical features, 7-54-A  
products and resources, 7-54-A, †68  
U. S. Marines' control of, 7-307, 12-456-D
- Hakoo**, Japanese poem, 13-349
- Hal Saffieni**, Malta, Hypogeum at, 6-†475
- Halbert**, weapon, 10-†355, †356, †359
- Halcyon** (kingfisher), bird, 4-50
- Halcyon days**, origin of term, 4-50
- Hale**, Adam de la, 12-216
- Hale**, Nathan, life, main article, 12-†497-98  
statue, 12-498
- Hale Observatory**, California, 1-†189
- Haleakala**, extinct volcano, 8-461
- Halevi**, Judah, 5-134
- Half-Breeds** in American politics, 7-286
- Half moon**, 1-126, 127
- "Half Moon,"** Hudson's ship, 13-†475 fol.; 7-128
- Half-tones**, printing, 10-†67-71
- Halfbacks** in football, 14-516
- Haliburton**, Thomas Chandler, Canadian author, biography, 13-†574-75; portrait, 13-574
- Halibut**, fish, 3-202, 204; 9-366
- Halicarnassus**, ancient city, Asia Minor, Mausoleum, 5-185, †186; 11-†52, 53
- Halifax**, N. C., convention, 1776, 8-292
- Halifax**, Nova Scotia, 7-29-M, 29-N, 33-A
- Hall**, Asaph, moons discovered by, 1-151
- Hall**, Charles Francis, 13-498
- Hall**, Fort, Idaho, trading post, 8-88
- Hall of Brave Dogs**, 4-491

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Hall of Columns**, Temple of Karnak, 11-413  
**Hall of Mirrors**, Palace of Versailles, 11-\*489  
**Hallam, Arthur**, friend of Tennyson, 13-250  
**Hallelujah Chorus**, from Handel's "The Messiah," 12-232  
**Hallett, E. S.**, French architect, 11-511  
**Halley, Edmund, life and work**, 13-†402; 1-163  
**Halley's comet**, 1-\*162, †163; 13-†402  
**Hallgrímsson, Jonas**, 6-420  
**Hallowe'en**, observance of, 14-586  
**Hallstatt, Austria**, 6-\*257  
**Hallstatt civilization**, 6-257, 258  
     ironwork, 12-6  
**Halo**, astronomy, 1-133, †272  
**Hals, Frans**  
     best painter of a single moment, 11-266  
     paintings, 11-\*261-63, 264  
     "Captain Reael's Company," 11-\*261  
     "Laughing Cavalier, The," 11-\*263  
     "Laughing Fisherboy," 11-\*263  
     "Nurse and Child, A," 11-\*262  
     "Yonker Ramp and His Sweetheart," 11-\*263  
**Ham**  
     packing, 9-\*322  
     Smithfield, 8-415  
**Hamal**, star, on September and October star map, 1-178-I  
**Hamburg, Germany**, 10-257  
     harbor, 6-\*239  
     map, 6-582, C2  
**Hamburg-American steamers**, 10-223  
**"Hamelyn, Pied Piper of,"** fairy tale, text, 14-†229-31  
     color plates, 14-frontispiece, 230  
**Hamilcar Barca**, Carthaginian general, 5-214  
     and Hannibal, 12-352  
     governor in Spain, 6-310  
**Hamilton, Alexander, biography**, main article, 12-†507-10  
     at Constitutional Convention, 12-\*496  
     author of "The Federalist," 12-509  
     duel with Aaron Burr, 12-\*509, 510  
     efforts for a strong central government, 12-509, 510; 7-362  
     financial achievements, 7-193, 200  
     ideas upheld by Chief Justice Marshall, 7-226  
     opposes Jefferson's views, 12-505, 510; 7-192  
     political leadership, 7-†192 200; 12-478  
     portraits, 12-\*508; 7-193  
     promotes water system, 7-\*396  
     relations with John Adams, 12-510  
     Republican party founded by, 7-193, 371  
     student at King's College, 10-559  
     tariff measures, 7-194  
**Hamilton, Elizabeth Schuyler** (Mrs. Alexander Hamilton), marriage, 12-\*507, 508  
**Hamilton, Lady Emma**, and Lord Nelson, 12-422  
**Hamilton, Philip**, killed in duel, 12-510  
**Hamilton**, capital of Bermuda, 6-\*489, 490  
**Hamilton, Ohio, industries**, 8-311  
**Hamilton, Mount, Calif.**, Lick Observatory, 1-\*105  
**Hamilton (Grand) River**, Labrador  
     length, 10-253  
     map, 7-593  
**Hamites**, people, 5-43, \*44, 49, 445, 460  
     Africa, 5-473-B  
**"Hamlet,"** by Shakespeare, 13-158  
**Hamlet**, character, played by Richard Burbage, 12-330  
**Hamlin, Hannibal**, vice president of the United States, 12-456-F  
**Hamlyn**, *see* Hamelyn  
**Hammer**, ear bone, 2-303  
**Hammer oyster**, 3-160  
**Hammer throw**, sport, 14-\*475, 476  
**Hammerhead**, shark, 3-\*149, 198  
**Hammerhus, castle of**, Denmark, 6-\*410  
**Hammers**  
     compressed-air type, 1-†462, 479  
     for hammering steel, 9-\*407  
     how to tighten heads, 1-307, 308, \*309  
     how to use, 14-†22  
     with magnetized head, 1-\*486  
**Hammurabi**, king of Babylon, 5-82, 85  
     law code, 5-86  
**Hampden, John**, 6-\*65  
**"Hampshire,"** meaning, 8-242-A  
**Hampshire ram**, 9-\*77  
**Hampton, Va.** harbor, 8-\*416  
**Hampton Court**, London, grape vine, 9-\*165  
**Hampton Normal and Industrial Institute**, 8-417  
**Hampton Roads, Va.**, 8-415, 416  
**Hampton Roads Port Commission**, 8-415  
**Hams**, *see* Ham  
**Hamusn, Knut**, 6-390  
**Han dynasty**, China, 5-320  
**Han Yü**, Chinese philosopher, 5-325  
**Hanauer**, chess player, 14-401  
**Hancock**, chief of Tuscaroras, 8-288  
**Hancock, John**, signer of Declaration of Independence, 7-173  
     signature, 12-481  
**Hancock, Thomas**, 9-268  
**Hancock, Walter**, steam carriages built by, 10-\*178  
**Hancock, Winfield S.**, candidate for president, 7-286  
**Hand**  
     bandaging, 2-\*403, \*407  
     blood vessels, 2-\*348  
     bones, 2-\*319, 320, \*322, color plate, \*327  
     in paintings of Leonardo da Vinci and Giotto, 11-152  
     in Van Dyck's paintings, 11-228, 294  
     muscles, 2-\*322, color plate, \*326  
     used as a measure, 10-373  
**Hand grenade**, bomb, 10-364, \*365  
**Hand-winged animals**, 4-272  
**Handball**, 14-486  
**Handel, George Frederick, life and works**, main article, 12-†263-65

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

- Handel, life and works—continued**  
 and Gluck, 12-271  
 music, 12-†232  
 music written for lute, 12-258-D  
 portraits, 12-\*232, \*241, \*264
- Handicraft, see Crafts; Manual training**
- "Handkerchief Pool,"** Yellowstone National Park, 1-\*35
- Handle, bronze, 12-\*19**
- "Handmaid of architecture,"** stained glass, 12-76
- Hangchow, China, 10-264**
- Hanging basket, how to make, 14-†50**
- Hanging Gardens of Babylon, 5-95, 96, 185, \*186; 11-†408**
- Hanging railways, 10-\*199**
- Hangnest (oriole), 4-28**
- Hankow, China, 10-264; map, 5-591, M7**
- Hanks, Nancy (Mrs. Thomas Lincoln), mother of Abraham Lincoln, 12-527**
- Hanna, Marcus Alonzo, 7-292**
- Hannibal, Carthaginian general, life and victories, main article, 12-†352-55**  
 campaigns, 5-214, 216  
 cracks rocks with fire, 1-41  
 crosses Alps, 5-\*213; 12-353  
 elephants used by, 12-353; 4-339  
 governor of Carthage, 12-355  
 kills himself with poisoned ring, 12-355  
 statue, 12-\*353
- Hanno, Carthaginian sailor, 4-251**
- Hanoi (Kesho), capital of Indo-China, 5-430**
- Hanover, house of, rule in England, 6-†74-81**
- Hanseatic League, 6-386, 411, 459; 7-352**
- "Hansel and Grethel,"** fairy tale, text, 14-†196-98
- Hanson, Howard, American composer, 12-257**
- Hanumans, monkeys, 4-†255**
- Happiness**  
 ideas of Greek philosophers, 13-9, 10  
 importance to health, 2-421  
 interpreted by Stoics, 13-57
- "Happy Boy, A,"** by Björnson, 13-98
- Hapsburg, house of, rule, 6-209**  
 Austria, beginning of rule in, 6-259  
 Austrian and Spanish Hapsburgs divided, 6-261  
 Bourbons rivals of, 6-214  
 Counter-Revolution led by, 6-214  
 fall, after World War I, 6-275  
 Flemish artists encouraged by, 11-202  
 Hohenzollerns oppose, 6-218  
 Holy Roman Empire, 6-261, 262  
 Hungary ruled by, 6-282-86, 288  
 revolt against, 6-270, 286  
 Napoleon humiliates, 6-224  
 Netherlands loyal to Charles V, 6-326  
 Peace of Westphalia, 6-181  
 power, 6-212, 263  
 quarrel with house of Valois, 6-176  
 Spain ruled by, 6-†325-27, 329
- Hapsburg, house of—continued**  
 Switzerland ruled by, 6-247-50  
 Velasquez paints members of, 11-252
- Hara-kiri, method of suicide, 5-347, 358**
- Harald III, Sigurdsson, king of Norway, 6-382**
- Harald Bluetooth, king of Denmark, 6-409**
- Harald Fairhair, king of Norway, 6-379-80**  
 dates, 6-377  
 end of male line, 6-386  
 taxes of, drive nobles from Norway, 6-380, 419
- "Harbor, The,"** by Ernest Poole, 13-347
- Harbor seal, 4-334**
- Harbors, main article, 10-†244-50**  
 Claude Lorrain's paintings of, 11-\*230, 238  
 Duluth, Minn., 8-\*192  
 Florida, 8-76  
 New York City, 8-\*268  
 San Francisco, Calif., 8-39  
*see also* Docks and Harbors
- Hard-case State (Oregon), 8-332**
- Hard coal, see Anthracite coal**
- Hard maple, 2-260**
- Hard sponge, 3-87**
- Hard spring wheat belt, 8-300**
- "Hard Times,"** by Charles Dickens, 13-245
- Hardanger Fiord, Norway, 6-\*383**
- Hardest substances in the world, 9-442**
- Harding, Florence Kling (Mrs. Warren G. Harding), 12-564**
- Harding, Warren G., president of the U. S., 12-456-C; 7-†332**  
 Washington disarmament conference, 7-338
- Hardtack, unleavened bread, 9-240**
- Hardy, Thomas, life and works, main article, 13-264-65**  
 portrait, 13-\*264
- Hare, constellation, star maps showing:**  
 Jan. and Feb., 1-178-B  
 March and April, 1-178-D  
 Nov. and Dec., 1-178-L
- Hare Indian dog, 4-494**
- Harems, Turkish, 5-413**
- Hares, animals, 4-384, †386 88**  
 distinguished from rabbits, 4-388
- Hargreaves, Edward, discovers gold in Australia, 5-556**
- Hargreaves, James**  
 invents spinning jenny, 10-340  
 responsibility for Industrial Revolution, 6-84
- Hargreaves, Mrs. Reginald, original of "Alice in Wonderland,"** portrait, 13-†266
- "Hark, hark, the lark,"** by Schubert, 12-285
- Harknuf, early explorer, 5-56**
- Harkness Memorial Building, Yale University, 8-\*56**
- Harlem, Negro section of New York City, 8-282**
- Harlequin, figure in comedy, 12-328**
- "Harlequin,"** painting by Picasso, 11-\*388
- Harlequin bat, 4-276**
- Harlequin coral snake, 3-490**
- Harmattan, wind, 5-470; 6-491**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



- Harmhab**, king of Egypt, 5-67  
 pretender, 5-64
- Harmony**, music, 12-215, 227
- Harney Peak**, in S. Dakota, 8-359
- Harold II**, king of England, and William the Conqueror, 6-14
- "Harold in Italy,"** symphony by Berlioz, 12-\*305, 306  
 viola used in, 12-258
- Haroun-al-Raschid**, caliph, empire of, 5-398
- Harp**, musical instrument, 12-258, \*206, \*221  
 Aeolian, 12-203  
 ancient, 12-\*206, \*221  
 chromatic, 12-258-A  
 Minnesingers accompanied by, 12-216  
 sound produced by, 1-449  
 Sumerian, 12-\*81
- "Harp of the Winds,"** painting by Homer D. Martin, 11-\*368
- Harpe, Bernard de la**, in Arkansas, 8-28
- Harpers Ferry**, W. Va.,  
 John Brown's Raid, 7-250; 12-534  
 water gap, 8-431, 436-A
- Harpies**, mythology, 14-420
- Harpoon**, used in Stone Age, 5-28, \*31
- Harpoon gun**, 4 141, \*447
- Harpsichord**, musical instrument, 12-258-D, \*221, 222, \*230, 231
- Harpy eagle**, 4-153, \*154
- Harrier (marsh) hawk**, 4-154, \*156
- Harriman, Edward H.**, 10-190, 7-282
- Harris, Benjamin**, publishing ventures, 10-74, †76
- Harris, Joel Chandler**, life; works, main article, 13-†338-39  
 portrait, 13-\*338
- Harris, Townsend**, helps develop Japanese foreign relations, 5-361
- Harrisburg**, Pa., 8-333  
 Antifederalist meeting, 8-333
- Harrison, Benjamin**, president of the United States, 12-456-C; 7-289  
 agitation over Indian territory in Oklahoma, 8-317, 318
- Harrison, Caroline Lavinia** (Mrs. Benjamin Harrison), 12-564
- Harrison, John**, rope maker, 9-288
- Harrison, William Henry**, president of the United States, hero of Tippecanoe, 12-456-C; 7-†228  
 portrait, 7-\*228  
 Tippecanoe, 8-112
- Harrison County**, Ohio  
 coal mining, 8-311  
 wool trade, 8-309
- Harrod, James**, American frontiersman, town named after, 8-135
- Harrod, Fort**, in Kentucky, 7-\*138
- Harrodsburg**, Kentucky, settlement, 7-\*138
- Harsha**, king of India, 5-372
- Harte, Francis Bret**, life and works, main article, 13-†333-34
- Hartebeest**, antelope, 4-\*417, 422
- Hartford**, Conn.,  
 capitol building, 8-\*55  
 Charter Oak monument, 7-\*128  
 founding, 8-56  
 manufactures, 8-60
- "Hartford,"** ship, in Battle of Mobile, 7-264
- Hartmann von Aue**, 6-211
- Hartog, Dirk**, reaches Australia, 5-545
- Harvard, John**, home of, 11-\*480
- Harvard University**, Cambridge, Mass., 8-\*167  
 47 Workshop, 13-354  
 Agassiz teaches at, 13-432  
 biology museum, 13-432  
 boat races, 14-533  
 botany department developed by Asa Gray, 13-412  
 date of founding, 8-175  
 library established, 10-556  
 observatory in Arequipa, Peru, 5-\*507
- Harvest mites**, 3-413, 406
- Harvest moon**, 1-128
- Harvest mouse**, 4-384
- Harvester ants**, 3-325
- Harvesting machinery**, main article, 10-†409-13; 9-\*26, \*100, 101, \*105, \*153; 7-†280; 2-\*180  
 primitive, 7-452
- Harvey, William**, life and scientific discoveries, main article, 13-†360-61  
 book explaining discoveries, 2-370  
 circulation of blood discovered by, 2-369
- Harz mountain group**, Germany, map, 6-582
- Harzwald**, Germany, 6-241-B
- Hasdrubal**, Carthaginian general, 12-353, 355
- Haskell Institute**, school for Indians, 8-132
- Haslam, "Pony Bob,"** heroism, 10-89
- Hassam, Childe**, art style, 11-370  
 "Golden Afternoon in Oregon," 11-\*371  
 "The Church at Old Lyme," 11-\*366
- Hastings, Warren**  
 Burke' speech against, 13-201  
 in India, 5-382  
 Sheridan's speech against, 13-206
- Hastings, Battle of**, 6-16  
 Song of Roland chanted before, 14-337
- Haswell, Anthony**, 7-199
- Hatamoto**, Japanese social class, 5-358
- Hatch Act**, 7-457
- "Hater of Mankind, The,"** by Molière, 13-112
- Hathaway, Ann**  
 and Shakespeare, 13-154  
 cottage, 12-\*186; 13-\*158
- Hathor**, Egyptian goddess of love and joy, 11-\*18; 12-\*103
- Hats**, main article, 9-†88-95  
 evolution of, 9-94  
 headdresses of many lands, 9-88, 91-94  
 how to select, 9-95  
 manufacture; materials used, 9-89-90, \*92, 119  
 painted by Gainsborough, 11-302
- Hats**, Swedish political party, 6-405

The asterisk (\*) refers to picture and its explanation only The obelisk (†) refers to illustrated text

- Hatshepsut**, queen of Egypt, 5-62-63  
 court dress, 11-16  
 expedition to Punt, 5-63; 10-161  
 obelisks, 11-20  
 portraits, 11-\*15  
 statue, 11-\*16  
 statues from tomb-temple of, 5-10
- Hatteras, Cape**, N. C., 8-296
- Hattie's Camp**, Newfoundland, airfield, 7-33
- Hatto II**, archbishop of Mainz, 6-207
- Hau Haus**, cannibals, New Zealand, 5-531
- "Haunted Pool, The,"** by George Sand, 13-130
- Hauslais, Laurentius**, organ designed by, 12-\*216
- Haussmann, George Eugene**, Paris improved by, 7-446
- Havana**, capital of Cuba, 7-56  
 harbor scene, 7-\*54, \*296  
 street scene, 7-\*55  
 temperature, 7-60
- Havana cigars**, 7-56
- Havas**, news agency of Paris, 10-79
- "Haverfield, Miss,"** portrait by Gainsborough, 11-301
- Haverhill**, Mass., industries, 8-172, 173
- Hawaii National Park**, 8-461
- Hawaiian Islands**, Pacific Ocean. description and history, 8-†456-60; general data, 8-461  
*see also* Index World War II, 6-493  
 annexation, 8-460; 7-300  
 area, 8-461  
 bird sanctuary, 4-517  
 climate, 8-461  
 "crossroads of the Pacific," 10-224  
 discovery, 8-458; 13-†490  
 government, 8-461  
 location, 8-461  
 map, 8-562  
   on map of World, 5-572  
 missionaries, 8-458  
 ownership, 5-522  
 parks, national, 8-461  
 people, 8-461; 5-521  
 physical features, 8-461  
 products and industries, 8-461  
   breadfruit, 9-212  
   pineapples, 8-\*459; 9-185, †186  
   canning, 9-185, \*230  
   sandalwood, 8-458  
   sugar, 9-116; 8-460  
 relations with U. S., 8-460  
 religions, 8-457, 458  
 settlement by white race, 8-458  
 shelter, 8-457  
 trade, 8-460; 10-242  
 ukulele played in, 12-258-E  
 volcanoes, 1-10, 76
- "Hawarden,"** home of William Gladstone, 12-442
- Hawk**, bird of prey, 4-†153-57  
 England, 4-175  
 in Egyptian mythology, 5-\*54
- Hawk—continued**  
 nest building and breeding, 4-154  
 red-tailed, 4-\*11
- Hawk moth**, 3-†290 fol.
- Hawk-moth caterpillar**, 3-\*286
- Hawke's Bay**, New Zealand, map, 5-598
- Hawkeye State**, 8-124-A
- Hawkeyes**, people of Iowa, 8-124-A
- Hawkins, John**  
 Drake sails with, 12-404  
 introduces potato into England, 9-143  
 plunders Spanish possessions, 6-56
- Hawkins, William**, 12-404
- Hawksbee, Francis**, and Guericke's machine, 1-\*494
- Hawksbill turtle**, 3-478
- Hawley-Smoot Tariff Act**, 12-456-D
- Hawyers, rope**, 9-\*286, 288
- Hawthorne, Julian**, and Louisa May Alcott, 13-321
- Hawthorne, Nathaniel**, life and works, main article, 13-†299-301  
 interest in Brook Farm, 7-244  
 portrait, 13-\*300
- Hay, John**, U. S. relations with China, 7-301; 12-456-D
- Hay**  
 baling machine, 2-\*177  
 growing on housetops, 2-\*259  
 harvesting processes, 2-\*177  
 producing regions of United States, 7-343-E  
 spontaneous combustion in, 2-19
- "Hay Wain, The,"** painting by Constable, 11-†314 fol., 322, 325
- Hayden Planetarium**, New York City, 1-\*190
- Haydn, Franz Josef**, life and works, main article, 12-†273-76  
 and Beethoven, 12-278  
 friendship with Mozart, 12-270, 274, 275  
 music for instruments; sonatas, 12-233 fol.  
 portraits, 12-\*234, \*241, \*273  
 sacred music, 12-237
- Haydon, Benjamin**, English painter, 11-318
- Hayes, Isaac**, 13-498
- Hayes, Lucy Ware Webb** (Mrs. Rutherford B. Hayes), 12-563  
 gown worn by, 9-\*15
- Hayes, Rutherford B.**, president of the U. S., 12-456-C  
 administration, 3-286  
 in election of 1876, 7-274  
 portrait, 7-\*286
- Hayne, Robert**  
 on Nullification, 7-225  
 Webster's "Reply to Hayne," 12-523, 524
- Haynes, Elwood**, gasoline car made by, 10-278
- Hays, John**, at Battle of Monmouth, 12-492-93
- Hays, Mary** (Molly Pitcher), at Battle of Monmouth, 12-†492-93
- Hayward, Nathaniel**, 9-268
- Hazard**, golf courses, 14-498
- Haze**, as a weather sign, 1-266

The asterisk (\*) refers to picture and its explanation only. The cheilisk (†) refers to illustrated text.

**Hazelnut**, 9-204

**Hazelnut**, tree, catkins, 2-\*159

**Hazy Islands Bird Refuge**, 8-16-B

**H. D.**, *see* Doolittle, Hilda

**"He who transplanted us continues to sustain,"** Connecticut's motto translated, 8-62

**Head, Sir Francis Bond**, governor of Upper Canada, 7-17

**Head**

arteries and veins, 2-\*378

color plates, 2-\*278, \*279

bandaging, 2-\*405

cross section, 2-\*337

nerves, 2-\*378, \*393

position of, 2-†319

*see also parts of head, as* Brain; Ears; Skull

**Head-buckler fish**, in Devonian period, 3-24

**Head-hunters**

Borneo, 5-\*425, 524

Philippine Islands, 5-563

**"Head of a Young Girl,"** painting by Vermeer, 11-268, \*269

**Headresses of many lands**, main article, 9-†88, 91-95

African, 5-\*447, \*471

American Indian, color plate, 5-frontispiece

Chinese, 5-\*315

*see also* Hairdressing styles, Hats

**Headrest, Egyptian**, 12-\*177

**"Heads of Angels,"** painting by Sir Joshua Reynolds, 11-\*295

**Healing**, Christian Science, Mrs. Eddy quoted, 7-557-58

**Health, how to keep well and strong**, main article, 2-†414-21

care of teeth, 2-316

coffee prevents sleep, 9-132

fresh air and sleeping, 2-\*339

helps prevent infection, 2-350

importance of temperature and humidity to, 1-241, 392, 393

mineral springs beneficial, 8-26

public health, 7-423, 443

smoking injurious to, 9-221

sun bath beneficial, 1-\*200; 2-291

sunlight essential to, 1-199

tea injurious in quantities, 9-138

vegetables essential to, 9-147

vitamins essential to, 2-365

*see also* First Aid; Public safety

**Healy, George Peter Alexander**, portrait by, 11-\*369

**Hearing, sense of**, main article, 2-†302-5

cat, 4-286

fin-footed carnivores, 4-332

effect of air pressure upon, 2-304

effect of brain injury, 2-389

effect of vibrations upon ear, 2-†303 *fol.*

organs of, in seals, 4-332

process of, 1-446, \*447, 448; 2-\*303, 305

tortoise, 3-472

*see also* Ears

**Hearne, Samuel**, Canadian explorations, 13-497

**Heart, construction, operation, and function**, main article, 2-†369-81

accelerator center, 2-378

altitude changes affect, 1-456

beat, 2-372, 373, 377

cause of pulse in blood vessels, 2-376

during exercise, 2-377, 378, 379

bone protection, color plate, 2-†278

bundle of His, 2-372

circulatory system and, color plate, 2-†326; 2-\*352

construction, 2-370, color plate, 374

cycle, 2-373

fish, 3-\*233

formation: veins and arteries, 2-\*374

illustrations, 2-\*373, \*374, \*375

color plate, 2-\*278, \*279

with other organs, 2-\*335, \*352

inhibitory center, 2-377

medicines for, 9-219; 10-550

muscle tissue, 2-370

muscles, 2-326, 327, 370, \*375, 377

myogenic theory of independent muscular action, 2-372

position and protection, 2-370

pumping station for the blood, 13-360

section showing auricles and right ventricle, 2-\*375

used as medicine, 5-446

valves, 2-373

*see also* Blood

**Heart Block**, cause of, 2-372

**"Heart of Midlothian, The,"** by Scott, 13-222

**"Heart of the West,"** by O. Henry, 13-342

**Heart urchin**, sea animal, 3-\*137, 138

**"Heartbreak House,"** drama by George Bernard Shaw, 13-272

**"Hearth, The Cricket on the,"** by Charles Dickens, 3-351

**Heartwood of stem**, 2-†29

**Heat**, caused by molecular motion, main article, 1-†379-86, 388, 395

a form of energy, 1-340, \*345, 349-51

absorption, 1-430

and end of universe, 1-351

caused by decomposition, 2-19

conduction, 1-†395-97; 10-515

convection currents, 1-†398

electric arc, 1-513

electricity produces, 1-†522-23

expansion due to, 1-\*476, 477-83

formed in oxidation, 2-334

from light energy, 1-430

generated by friction, 1-165, 320

given off by radium, 9-425

human body, 2-292, 331, 347

inside the earth, 1-†31-36, †383

insulation against, 1-†396, \*405

lack of, on moon, 1-140

life dependent on, 1-373

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Heat—continued**

- light energy transformed into heat energy, 1-430
- light without heat, 2-17
- measurement; temperature, 1-†388-93, 407
- melting points, table, 1-†392
- physical changes caused by, 1-†402-10; 10-552
- plants affected by, 2-194-95
- radiation, 1-†398, †399
- region, atmosphere, 1-†454
- reflection, 1-400
- regulated by clouds, 1-237
- sources, 1-†382-86
- sterilization by, 9-226
- sun, 1-3, 4, 113, 207
- transmission, 1-†395-400
- will not cause fire in a vacuum, 1-4
- see also Heating systems; Temperature
- Heat, canned**, alcohol in, 10-547
- Heat exhaustion**, treatment for, 2-404
- Heat waves**, 1-†399
  - compared with light waves, 1-208, 418
  - length, 1-419
- Heath family**, plants, 2-172
  - fruits, 2-174
- Heath hen**, 4-†97
- "Heathen Chinese, The,"** by Bret Harte, 13-334
- Heather**, plant, leaves of, 2-252
- Heating systems, cave man to modern times**,
  - main article, 10-†379-85
  - automatic water-heater, 1-476, †477
  - central heating systems, 10-†382-85
  - electrical, 10-384
  - fireplaces, 10-380, †381
  - fuels for furnaces, 10-384
  - hot-water method, 1-398
  - humidity, 1-392, 393
  - solar heating, 10-385
  - steam, 1-†479, †480
  - stoves, 12-†58, 465; 10-381
  - temperature regulation, 1-476-78
  - thermostats, 1-†477, †480; 10-385
  - ventilation, 10-385
- Heating unit**, electrical, 1-523
- Heaven**, Christian symbols for, 11-†89
- Heaven Peak**, Glacier National Park, 7-†406
- "Heavens Are Telling, The,"** by Haydn, 12-†276
- Heavy industries**, 8-185
- "Heavy water"** (deuterium), 1-558-D
- Hebe**, bride of Hercules, 14-430
- Hebrew calendar**, 10-476
- Hebrew language**, alphabet, 5-111; 10-43, 45
- Hebrew literature**, Talmud, 5-133
- Hebrew prophets**, 13-522; 5-396, 422
- Hebrew University**, Palestine, 5-†141
- Hebrews, ancient people**, ancestors of Jews
  - a Semitic people, 5-44, 97
  - calendar; oldest date in history, 10-477
  - defined, 5-127
  - early history told in Bible, 5-118
  - knowledge of iron, 12-2

**Hebrews—continued**

- language and literature, see Hebrew language; Hebrew literature
- map of ancient kingdom, 5-†48
- music and musical instruments; Temple service, 12-204, 205
- oppressed by Rameses II, 5-58
- shoes, 9-57
- skill in gold and silver, 12-79
- sufferings during stay in Egypt, 5-†69
- trade, 5-127
- see also Jews; Semites
- Hebrides**, islands, Scotland, description, 6-†487-88
  - conquered by Norway, 6-380
  - Fingal's Cave, 6-488
  - map, 6-574
  - won back by Scotland, 6-113
- Hecateus**, map made by, 5-160
- Heckscher Building**, New York, 11-†519
- Hecla**, or **Hekla**, volcano of Iceland, 6-162-C
- Hectograph**, 1-†359
- Hectoliter**, 10-377
- Hectometer**, 10-377
- Hector**, Trojan hero
  - in "The Iliad," 13-28
  - story of, 5-†151
- Hector and Menelaus**, Greek painting, 11-36
- "Hedda Gabler,"** by Ibsen, 13-88
- Hedgehog**, 4-276, †281, 282
- Hedwig**, queen of Poland, see Jadwiga
- Heel**, anatomy
  - bandages in case of injury, 2-†407
  - muscles, 2-328, †331
- Heel**, of shoe, 9-63, 64
- "Heemskirk,"** ship of Abel Jensen Tasman, 5-†533
- Hegel, Georg Wilhelm Friedrich**, Schopenhauer a rival of, 13-23
- Hegenberger, Albert F.**, aviator, portrait, 10-†324
- Hegeso relief**, Greek carving, 11-†40, 41
- Hegira**, flight of Mohammed, 13-523
- Heidelberg University**, Heidelberg, Germany,
  - library established, 10-556
- Heifers**, 9-†331, 334
- Heifetz, Jascha**, violinist, 12-258
- Heimin**, Japanese social class, 5-347, 357
- Heimwehr**, Austrian middle-class movement, 6-275
- Heine, Heinrich, life and works**, main article, 13-285-86
  - portrait, 13-†285
  - "Songs," 13-285, 286
- Hejaz**, former kingdom of Western Asia, now a division of Saudi Arabia
  - maps, 5-583, 580
- Heke's Rebellion**, 5-537
- Helderberg limestone**, 8-266
- Helderberg Mountains**, 8-283

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Helen of Troy**  
in story of the Iliad, 13-28  
story woven by, 12-140
- Helen Pavlovna**, grand duchess, takes nurses to  
Crimea, 7-426
- Helena, Saint**, 12-364
- Helena, Mont.**, 8-\*215, 219  
temperature, 8-220
- Helicopter**, 7-488; 5-\*187; 10-\*328-K, \*328-N,  
\*368; Hoppi-Copter, 10-\*328-Q
- Heligoland**, island, North Sea, sinking of, 1-69
- Heligoland Bay**, Europe, maps, 6-582, 599
- Helios**, *see* Apollo (Phoebus Apollo)
- Heliotrope**, Greek myth about, 14-441
- Helium**, element, 9-426  
atomic structure, 1-\*541  
freezing point, 1-\*392  
in air, 1-376  
in sun, 1-559  
symbol, atomic no. and atomic wt. 1-\*551  
Texas' supply, 8-384  
use in airships, 1-375, 377, 473, 547; 10-315
- Hell-diver** (grebe), bird, 4-110, 122
- Hell Gate power station**, New York City, 1-  
\*507
- Hellas**, name of, Greece, 5-151
- Hellbender**, salamander, 3-430
- "Hellements of Hickonomics,"** verses by Ste-  
phen Leacock, 13-580
- Hellenes**, why Greeks were called, 5-150
- Hellenistic Age**, 5-181, art, 11-55
- Hellespont** (Dardanelles), strait, 5-162  
Nerxes' bridge across, 9-284
- Helluland**, No. Amer., discovered by Leif Eric-  
son, 7-111; location, 7-2
- Helmet bird**, 4-\*180
- Helmets**, of soldiers, 10-351 *tol.*  
gold, 12-81, \*83  
of diving suit, 1-522, \*526
- Helmholtz, Hermann Ludwig Ferdinand von**  
efforts to reproduce sound, 10-110  
theory of sun's heat, 1-386
- Helmont, Jan Baptista van**, experiment in plant  
feeding, 2-42
- Helmore, Thomas**, choirmaster, 12-319
- Helms**, chess player, game, 14-491
- Helots**, serfs of ancient Sparta, 5-154
- Helsingfors**, Finland, 6-464  
location by Lat and Long 6-464-B  
rainfall and temperature, 6-464-B
- Helsinki**, Finland, *see* Helsingfors
- Helst, Bartholomeus van der**  
"The Musician," painting, 11-\*260
- Helvella**, fungus, 2-\*73
- Helvetia**, Roman province, 6-244
- Helvetians**, Germanic people, 6-244
- Helvetic Republic**, set up by France, 6-253
- Hemicycle of Berossus**, 10-461
- Hemingway, Ernest**, author, 13-351
- Hemispheres, cerebral**, 2-\*384, \*385, 386
- Hemispheres**, of earth, 5-518-B
- Hemlock**, tree, 2-\*268  
paper made from wood, 9-277  
wood, 9-258
- Hemming stitch**, sewing, 14-†72
- Hemoglobin**, *see* Haemoglobin
- Hémon, Louis**, French-Canadian author, 7-29-1
- Hemp**, rope made from, 9-†285; 5-\*516; 7-\*572  
*see also* Manila hemp
- Hempseed oil**, 9-312
- Hemu**, Hindu general, 5-375
- Hen**, *see* Chickens
- Henderson, Richard**, American frontiersman,  
land purchase in Kentucky, 8-138-B
- Henderson, William**, opening first legislature of  
Transylvania, 7-\*214
- Hendricks, Thomas A.**, vice president of the  
United States, 12-456-F
- Hengist**, Jutish chief, in England, 6-8; 10-9
- Henley on Thames**, England, boat races, 14-533
- Henley Week**, in England, 14-533
- Hennepin, Louis**, Flemish missionary and ex-  
plorer,  
Falls of St. Anthony discovered, 8-191  
Niagara Falls discovered, 8-274  
on the "Griffon", 7-\*4
- Henrietta Maria**, queen of Charles I., portrait,  
6-\*61; 11-\*216, 228  
Maryland named after, 8-158
- Henry IV**, Holy Roman emperor, 5-296 97  
humiliation at Canossa, 5-296; 6-208, \*295, 296  
opposes Pope Gregory VII, 5-296
- Henry V**, Holy Roman emperor, quarrel over  
investiture, 6-†208
- Henry VI**, Holy Roman emperor, 5-299, 6-209
- Henry I**, king of England, 6-20
- Henry II**, king of England, reign, 6-20-23  
and Thomas à Becket, 6-21  
and Wales, 6-139  
conquers Ireland, 6-148  
relations with his sons, 12-372
- Henry III**, king of England, reign, 6-24  
defeated by Louis IX, 12-377  
rule in Ireland, 6-149
- Henry IV**, king of England, 6-34  
and Chaucer, 13-143  
and Richard II, 6-†34  
portrait, 6-\*36
- Henry V**, king of England, reign, 6-35  
and Dick Whittington, 6-\*35  
war in France, 6-174
- Henry VI**, king of England, reign, 6-38  
deposed, 6-39  
portrait, 6-\*37  
proclaimed king of France, 6-174  
wars in France, 6-36
- Henry VII**, king of England, reign, 6-39, 42  
and Wales, 6-140  
Chapel, Westminster Abbey, 11-475  
flag, 14-573  
portrait, 6-\*152  
treatment of Ireland, 6-151

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Henry VIII, king of England, life, main article,** 12-†391-93  
 and Irish church, 6-152  
 and Thomas More, 13-148  
 and Wales, 6-140  
 at the Field of the Cloth of Gold, 6-44  
 becomes head of Church of England, 12-392; 13-148  
 dissolves monasteries, 6-152  
   result, 6-54  
 foreign relations, 12-392  
 Holbein court painter to, 11-214  
 marriages, 6-44, 46  
 nunnery seized by order of, 7-\*359  
 orchestra, 12-258-B  
 playing golf, 14-\*495  
 portraits, 6-\*43; 12-\*392  
   by Holbein, 11-\*212  
 reign, 6-43  
 relations with Scotland, 6-119, 120  
 royal postal service, 10-86
- Henry II, king of France, tennis played by,** 14-466
- Henry III, king of France,** 6-177  
 elected king of Poland, 6-450
- Henry IV, king of France,** 6-177, †179  
 influence on architecture, 11-488  
 tapestry industry encouraged by, 12-143
- Henry I, the Fowler, king of Germany,** 5-294; 6-208
- Henry III, king of Navarre, see** Henry IV, king of France
- Henry, Prince, son of Henry II, king of England,** 12-372
- Henry of Burgundy, count,** 6-338
- Henry of Lorraine, third duke of Guise, see** Guise, Henry of Lorraine, third duke of
- Henry of Valois, see** Henry III, king of France
- Henry the Lion, duke of Saxony, and the Guelphs,** 5-298
- Henry the Navigator, Portuguese prince, studies and explorations,** 6-340  
 compass used by sailors, 10-455  
 maritime college established by, 7-113  
 sails down African coast, 10-167
- Henry, Edward L., painting,** 11-\*369
- Henry, Joseph,** 10-96  
 relations with Alexander Graham Bell, 10-111, 112  
 study of electromagnets, 1-491
- Henry, O., see** Porter, William Sydney
- Henry, Patrick, life, main article,** 12-†482-83  
 champions cause of Virginia's frontiersmen, 8-412  
 urges colonists to resist England, 7-161
- Henry, William,** 10-220
- Henry, Fort, taken by Grant,** 7-260, 262
- Henry C. Folger Library, Washington, D. C.,** 10-561
- Henry E. Huntington Library, San Marino, Calif.,** 10-561
- Henry E. Huntington Library and Art Gallery, Pasadena, Calif.,** 8-42-A
- "Henry Esmond,"** by William Makepeace Thackeray, 13-241
- "Henry IV,"** by Shakespeare, 6-36; 13-†158
- "Henry V,"** by Shakespeare, 13-158
- Henry Mountains, Utah,** 8-391, 392  
 formation, 1-22
- Henry Street Settlement,** 7-440, \*439, \*443
- Hens, see** Chickens
- Hens, water,** 3-223
- Henslow, John Stevens, friend of Darwin,** 13-434
- Henson, Negro preacher, "Uncle Tom's Cabin" inspired by,** 13-319
- Henson, W. S., model for airplane,** 10-\*316
- Heorot, hall, in Beowulf legend,** 14-319, \*320
- Hepatic veins, anatomy,** 2-375
- Hephaestus, god, see** Vulcan
- Hepplewhite, George, furniture by,** 12-\*191, 194, \*197
- Hera (Juno), goddess, see** Juno
- "Hera of Samos," statue,** 11-\*39
- Heraclea, battle,** 5-206
- Heracles, god, see** Hercules
- Heraclitus, Greek philosopher**  
 philosophy, 13-12  
 theory of matter, 13-2
- Heraeum, temple, Greece,** 5-\*167
- "Herald, The New York,"** 7-242; 13-554
- Herald, specialist in heraldry,** 5-307
- "Herald of Christian Science, The,"** 13-558
- Heraldry,** 5-307
- Herbaceous stems,** 2-31-32
- Herbert, George,** 13-166
- Herbivores, plant eating animals, in South America,** 3-56
- Herbs**  
 grasses are true herbs, 2-178  
 one of largest, 9-181  
 stems, 2-31
- Herbst, Josephine, novelist,** 13-355
- Herculaneum, ancient city, Italy**  
 bronze work, 12-18  
 destruction of, 5-238, 257  
 difficulty of unearthing, 5-259
- Hercules, god, labors of,** 14-†426-30  
 Farnese Hercules, statue, 11-\*66  
 pollaiuolo's "Hercules Strangling Antaeus," 11-\*138  
 restores Alcestis to life, 14-454  
 slaying of Nessus, 14-\*457  
 strangles serpents, 5-189  
 temple to, on Monacan headland, 6-466
- Hercules, constellation,** 1-178  
 star maps showing:  
   July and August, 1-178-G, 178-H  
   March and April, 1-178-C  
   May and June, 1-178-E, 178-F  
   Nov. and Dec., 1-178-K  
   Sept. and Oct., 1-178-I  
 sun drifting toward, 1-114

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Hercules beetle**, 3-340, \*341, \*342  
**"Hercules Strangling Antaeus,"** sculpture by Pollaiuolo, 11-\*138  
**Herder, Johann Gottfried**, life and works, main article, 13-†276-77  
**Herds**, of animals  
 cattle, 9-318, \*319, †320  
 hippopotamuses; raids, 4-439  
 peccaries, 4-436  
 springboks, 4-418  
 wild horses, 4-\*510  
**Herdsmen**, constellation, *see* Boötes  
**Hereditary rule**, 7-347  
**Heredity**, Mendel's law, 13-†413-15  
**Heresy**, medieval, 5-283; 6-323  
 burned at stake, 6-48  
**"Hereward the Wake,"** by Kingsley, 13-247  
**Herjulfson, Bjarni**, 7-110  
**Hermann (Arminius)**, German hero, 5-\*263  
 defeats Romans, 6-204  
**"Hermann and Dorothea,"** by Goethe, 13-283  
**Hermes**, god, *see* Mercury  
**Hermes of Praxiteles**, statue, 11-†50  
**Hermit crab**, disguises worn by, 3-84, †93, \*106, \*143, \*174, 182  
**Hermit hummer**, bird, 4-178  
**Hermit solen**, mollusk, 3-153  
**Hermit thrush**, bird, 4-53  
 state bird of Vermont, 8-404  
**"Hernani,"** by Victor Hugo, 13-126  
**"Hero of Alexandria,"** invents primitive steam engine, 10-†396  
**Herod I (the Great)**, king of Judea, temple at Jerusalem enlarged by, 5-125  
**Herodotus**, Greek historian  
 cited, 5-100; 9-240; 12-82, 130  
 description of Babylon, 5-14  
 description of Egypt, 5-7  
 history of the Persian War, 5-172  
 quoted, 10-92  
 refusal to credit stories of Africa, 5-448  
**"Heroes and Hero Worship,"** by Carlyle, 13-236  
**Heroic plays**, written by Dryden, 12-331  
**Heron**, bird, 4-\*101-3, 105-8, †144 fol.; 3-\*232  
 nest building and breeding, 4-107  
 powder-down feathers, 4-13  
**"Hero's Life, A,"** by Richard Strauss, 12-252  
**Herreshoff, Nathaniel G.**, yacht builder, 14-530  
**Herrick, Robert**, 7-308  
**Herring, John Frederick**, painting, "Seed Time," 7-\*450  
**Herring**, fish, 9-306  
 destroyed by squids, 3-170  
 schools of; migration, 3-197  
**Herring gull**, bird, 4-201, 202  
 bird refuges, Wisconsin, 8-446-A  
**Herringbone**, skiing, 14-522, \*521  
**Herriot, Edouard**, 6-202  
**Herschel, Caroline**, astronomical work, 13-403, 405  
**Herschel, Sir John**, life, scientific work, 13-405  
**Herschel, Sir William**, life, scientific discoveries  
 main article, 13-†403-5  
 astronomical discoveries, 1-114, 157  
 portrait, 13-\*404  
**Hershey, P.a.**, chocolate factory, 8-339  
**Hertz, Heinrich Rudolf**  
 electric wave discoveries, 10-115  
 produces radio waves, 1-418  
**Hertzian waves**, 1-418; 10-494  
 in wireless, 10-121  
**Hertzog, James Barry**, Boer leader, 5-491  
**Herzegovina**, prov., Yugoslavia, Austrian occupation, 6-273  
**Herzl, Theodore**, "The Jewish State," 5-138  
**Hesperides**, mythological maidens, guard golden apples, 14-429  
**Hesperidium**, fruit group, 2-121  
**Hesperornis**, prehistoric bird, 3-43  
**Hesperus**, evening star, 14-429  
**Hessian fly**, 3-360  
**Hessians**, in Battle of Trenton, 7-\*169  
**Hestia**, goddess, *see* Vesta  
**Heth, Joyce**, 12-577  
*Hevea brasiliensis*, rubber trees, 9-†263 fol  
**Hexagon**, geometric figure, 10-439  
**Heysham**, England, church, 11-\*480  
**Heyward, Du Bose**, dramatist, 13-355  
**Hiawatha**, character in Indian legend, 8-270  
**"Hiawatha,"** by Henry Wadsworth Longfellow, 13-303  
 quoted, 3-228; 10-350; 14-509  
**Hibernation**, of animals, 4-372  
 alligator, 3-444  
 bear, 4-316  
 dormouse, 4-384  
 honeybee, 3-297  
 marmot family, 4-371  
 ground hog or woodchuck, 4-372  
 rattlesnakes, 3-492  
 toads and frogs, 3-416  
 tortoises, 3-467  
**Hiccups**, treatment for, 2-403  
**"Hickety, Pickety,"** nursery rhyme, text, color plate, 14-†174-D  
**Hickory**, tree  
 bark of shagbark hickory, 2-31  
 leaf bud, 2-\*133  
 nuts, 9-201-3; 2-\*159  
 wood, 2-159; 9-258  
**"Hickory, Dickory, Dock,"** nursery rhyme, text, color plate, 14-174-F  
**Hidalgo, Miguel**, leads Mexican revolt, 7-82  
**Hidalgo**, state, Mexico, map, 7-597  
**Hides**, *see* Leather  
**Hideyoshi**, Japanese leader, 5-351  
 opposes Christianity, 5-354  
**Hieratic numerals**, 10-\*422  
**Hieroglyphics**  
 Egyptian, 10-\*38, †39 fol.; 5-144

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Hieroglyphics**, Egyptian—*continued*  
 hieroglyph meaning "millions of years," 10—  
 \*421  
 numerals, 10—†421, \*422  
 Hittite, 5—115  
**Higginson, Thomas**, and Emily Dickinson, 13—  
 323  
**High**, in meteorology, 1—228, 261, 277  
**High-holder**, bird, *see* Flickers  
**High Knob**, or **High Point**, N. J., 8—252  
 State Park, 8—252-A  
**High Plains**, North America, 7—33-M, 343-10  
**High Point**, N. C., furniture manufacture, 8—295  
**High Point Park**, N. J., resort, 8—249  
**High Tartary** (Eastern Turkestan), Asia, 5—436  
**"High Tide,"** painting by Winslow Homer, 11—  
 \*368  
**Highboy**, chest of drawers, 12—\*195, 198  
**"Highland Mary,"** by Burns, 13—†210  
**Highland moccasin** (copperhead), snake, 3—492,  
 \*501  
**Highland of Guiana**, South America, 1—29  
**Highland Rim Plateau**  
 Kentucky, 8—134, 138-A  
 Tennessee, 8—366, 373  
 climate, 8—373  
**"Highland Shepherd's Chief Mourner, The,"**  
 painting by Landseer, 11—\*310  
**Highlanders**, Scotch, 6—124, †129 fol.  
 huts, 6—\*121  
 in America, 8—289, 292  
**Highlands**, Scottish, 6—108-B  
**Highlands**, section of New Jersey, 8—249  
**Highlands of the Hudson**, 8—266  
**Highways**, *see* Roads  
**Hilaria del Carretto**, sculpture of, 11—\*126  
**Hildebrand**, *see* Gregory VII, pope  
**Hill, Ambrose Powell**, portrait, 7—\*257  
**Hill, James J.**, 10—190; 7—282, 309  
**Hill, Sir Rowland**, 10—87  
**Hillaby, Mount**, on Barbados Island, height, 7—  
 54-B  
**Hillman**, Sahara explored by, 5—453  
**Hills**  
 cut in, 1—\*19  
 drumlins, 8—439  
**Himalaya mountain system**, description, 5—  
 †432, 441  
 believed home of the gods, 1—25  
**Countries east and west of**, 5—†432-41  
 glacial center, 3—60  
 India, 5—387-A  
 maps, 5—586, 580  
 Mount Everest, 1—25, \*26, 29  
 photographic surveys, 5—432  
 sacred lake, 5—366, 369  
 wall of India, 5—366  
**Himalayan black bear**, 4—318, \*319  
**Himation**, Greek cloak, 9—\*6  
**Himlico**, voyage of, 13—494  
**Hincks, Francis**, 13—567  
**Hind**, *see* Deer  
**"Hind and the Panther, The,"** by Dryden, 13—  
 174  
**Hindemith, Paul**, 12—252  
**Hindenburg, Paul von**, president of Germany  
 administration, 6—240  
 portrait, 6—\*237  
**"Hindenburg,"** zeppelin, 10—\*318  
**Hindmarsh, John**, portrait, 5—\*554  
**Hindu Kush**, mt. range, Asia, map, 5—586  
**Hinduism**, 5—368, 369, 371-72  
**Hindus**  
 animals sacred to  
 hanuman monkey, 4—255  
 ox, 9—333  
 white bulls, 4—394  
 bow used in playing musical instrument, 12—  
 224  
 caste system, 5—368, 369  
 cruel practices, 5—375  
 East Indies, 5—523  
 India  
 and Mohammedans, 5—375, 378, 387  
 conquests and power, 5—379, 382  
 Sepoy Rebellion, 5—384  
 numerals, 10—423  
 protection of peacocks by, 4—191  
 racial ancestry, 5—367  
 racial classification, 5—44  
 snake charmers, 3—\*486, 487, 496  
**Hindustan**, region of India, 5—387-A  
**Hinge joint**, anatomy, 2—\*320, 324  
**Hingeback tortoise**, 3—\*472, 473, \*479  
**Hip joint**, 2—\*320  
**Hipparchus**, astronomer, map of stars, 1—177  
**Hippo**, city of ancient Numidia, St. Augustine's  
 work in, 13—533  
**Hippocrates, the father of medicine**, main article,  
 13—†357-58; 5—172  
**Hippocratic oath**, 13—358  
**Hippodamia and her maidens**, mythology, 14—  
 447, 448  
**Hippolyte and Hercules**, mythology, 14—429  
**Hippomenes and Atalanta**, mythology, 14—†453  
**Hippopotamus**, animal, 4—\*432, †436-39  
 destruction of cultivated fields, 4—439  
 drawing and mounting, 14—\*68  
 Egyptian sculpture, 11—\*15  
 in zoo, 4—\*477  
 origin of name, 4—437  
**Hiram**, king of Tyre, 5—110, 124  
**Hirohito**, emperor of Japan, 6—\*500  
**Hiroshima**, Japanese city, 6—\*553, 555  
**His, Wilhelm**, neuromuscular bundle of heart  
 discovered by, 2—372  
**Hispaniola**, *see* Haiti, island  
**Hispano-Moresque lusterware**, 12—56  
**Hisarlik**, mound of, Asia Minor, nine Troys  
 buried under, 5—16  
**Historical monuments**, U. S., 7—†411-14  
**"Histories of Troy, The,"** first book printed in  
 English, 10—54

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**History** (*see under names of countries for individual histories*)

**beginning of**, 5-†42-45, 48

difference between anthropology and, 1-60

historical biography, 12-335-556 (*see also* Contents Volume 12 *for list of biographies*)

*see also names of historical characters in index, as* Bolivar; Drake; Solon

oldest date, 5-49; 10-177

"**History of Animals**," by Aristotle, 13-9

"**History of Art of Antiquity**," by Winckelmann, 11-288

"**History of England**," by David Hume, 13-16

"**History of New York...**" by Diedrich Knickerbocker (Washington Irving), 13-291

"**History of Reynard the Fox, The**," printed by Caxton, 14-324

"**History of the Franks**," by Gregory of Tours, 5-291

"**History of the French Revolution**," by Carlyle, 13-236

"**History of the Kings of Britain, The**," by Geoffrey of Monmouth, 14-377

"**History of the Standard Oil Company**," by Ida Tarbell, 12-583

"**History of the World**," by Sir Walter Raleigh, 13-480

**Hitchcock, Frank H.**, 10-92

**Hitches**, knots, splices, how made, 14-†555

**Hitler, Adolf**, rule in Germany, 6-240-41

biography, 6-566

Nazi party congress, reviews, 6-†494

plans for expansion, 6-275, 443, 454

portrait, 6-†240

religious conflicts, 7-556

**Hittites**, people, **description and history**, main article, 5-†114-15

appearance, 5-115, 403

art, 11-27

carving, 5-115

in Palestine, 5-64, 118

iron made by, 9-399

map, 5-†48

racial origin, 5-114

relations with Assyrians, 5-89, 115

sweep toward Egypt, 5-64

war with Egyptians, 5-68

writing, 5-115

**Hitzig**, study of brain, 2-385, 388

**Hives**, *see* Bee hives

**Hoang-ho**, *see* Hwang River

**Hoard, Margaret**, statue by, 11-†373

**Hoaxes**, perpetual-motion, 1-†315, 316

**Hoban, James**, 11-511, 513

**Hobart, Garret A.**, vice president of the United States, 12-456-F

**Hobart, Tasmania**, 5-544, 552

**Hobbema, Meindert**, painting, 11-270

**Hobbies**, *see* Contents Volume 14

*see also* Architecture; Art; Arts and crafts;

**Hobbies—continued**

Drawing; Nature study; Sailing; Things to do; Things to make

**Hoboken, N. J.**, commuter traffic, 8-248

**Hobson, Captain**, makes New Zealand British possession, 5-†534

**Hobson, Montana**, sapphire mine, 8-220-A

**Hochelaga**, Indian village, on site of Montreal, 13-474

**Hockey**, game, main article, 14-†523-24

**Hockey stick**, how to make, 14-†33

**Hocking River, Ohio**, 8-312-A

**Hoe**, primitive, 7-†451

**Hoecake**, 9-106

**Hofer, Andreas**, leads Tyrolese rebellions, 6-†269, †272

**Hoffman, Maurice**, song by, 8-242-B

**Hog Island, Wis.**, bird sanctuary, 4-517

**Hog-nosed snake**, 3-†483, 500

**Högalid church**, Stockholm, 6-†400

**Hogarth, William**, life and art, 11-†293, †294, 296

paintings

"The Marriage Contract," 11-†293

"The Shrimp Girl," 11-†294

**Hogs, animal family**, main article, 4-†432-39

considered unclean, 6-99; 5-384

domesticated hogs, 4-†434, †435; 9-†325, †327

bacon factory, 6-†416-A

grown for Smithfield hams, 8-415

pork packing, 9-†322, 329

production in United States, 9-329

skins, 9-69

transportation, 9-326

used as food, 9-317, 318

drawing and mounting, 14-†63

hippopotamus, 4-†432, †436-39

peccaries, 4-†434, 435

prehistoric form, 3-†46, †48

tusks, 4-†433, 434, 437

wild pigs, 4-†432-36

**Hogshead**, unit of measure, 10-375

**Hohenstaufen, house of**, rise and fall, 6-209

end of, 5-209; 6-298, 299

**Hohenzollern, house of**

end of power, 6-234, 239

rise in Prussia, 6-217

**Hojo**, Japanese rulers, 5-349, 350

**Hokkaido**, island, *see* Yezo

**Hokusai**, Japanese artist, 5-359

**Holbein, Hans**, life and art, 11-†212-14

court painter in England, 11-214

portraits

Erasmus, 13-†83

Henry VIII, 11-†212

Jane Seymour, 11-†213

John Chambre, 11-†213

Margaret Wyatt, Lady Lee, 11-†214

Robert Cheseaman, King Henry's falconer, 11-†213

Sir Thomas More, 11-†213

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Holidays and festivals**, main article, 14-†577-90  
 Corpus Christi, time for miracle plays, 12-327  
 May Day celebration, 12-326  
 original meaning, 14-581  
*for lists of state holidays see subhead holidays under each state*
- Holland**, *see* Netherlands
- Holland, Clifford M.**, engineer of Holland Tunnel, 1-462
- Holland, John G.**, New Zealand statesman, 5-541-A
- Holland, John P.**, makes first modern submarines, 10-307, 309
- Holland grass**, planted on Oregon coast, 7-\*466
- Holland Torpedo Boat Company**, 10-307
- Holland Tunnel**, Hudson River, 10-\*202, 207  
 compressed air used in construction, 1-†460-62
- "Holle, Dame,"** fairy tale, text, 14-†199-200
- Hollywood**, Calif., 8-36; 10-512
- Holmes, Hodgen**, 10-407
- Holmes, John F.**, song by, 8-242-B
- Holmes, Oliver Wendell**, life and works, main article, 13-†308-9; portrait, 13-\*309
- Holmium**, element, symbol, atomic no. and wt., 1-\*551
- Holst, Gustav**, English composer, 12-257
- Holstein**, dist., Germany, 12-448  
 Prussian and Austrian interference in, 6-229  
*see also* Schleswig-Holstein
- Holstein cattle**, 9-332, \*333, 334
- Holston River**, Virginia and Tennessee, 8-373, 418
- Holy Alliance of European kings**, 5-506
- Holy Apostles, Church of**, Constantinople, decoration, 12-86  
 St. Mark's modeled after, 11-446
- Holy Cross National Monument**, 8-52-B
- "Holy Family"**  
 painting, 9-\*7  
 painting by Andrea del Sarto, 11-\*166  
 painting by Michelangelo, 11-\*156
- "Holy Family with the Rabbit,"** painting by Titian, 11-180
- Holy Grail**  
 quest for, 14-†393-98  
 Rossetti's painting, 14-\*394
- Holy Isle**, England, abbey of Lindisfarne, 11-84
- Holy Land**  
 compared with Pennsylvania in size, 5-\*133  
*see also* Crusades; Palestine
- Holy League**, Switzerland a member of, 6-250
- Holy men of India**, 5-\*383
- "Holy Night, The,"** painting by Correggio, 11-184
- Holy Roman Empire**, 5-295 fol.; 6-208-14  
 and Hungary, 6-279, 281  
 Austria  
   Hapsburgs became emperors, 6-260, 261, 262, 263  
   House of Babenberg's relations with, 6-258  
   power, 6-212
- Holy Roman Empire—continued**  
 Charlemagne founder of, 5-293; 6-168, 258  
 emperors, 5-295  
 ended by Treaty of Pressburg, 12-430  
 Guelph and Ghibelline struggle, 5-286, 297-99  
 Hohenstaufens, 5-297, 299; 6-298  
 investiture conflict, 6-208  
 map, 5-\*293  
 Napoleon forces abolition, 6-224, 268  
 organization, 6-210, 262  
 Otto revives, 5-295  
 quarrel of Hapsburgs and French Valois, 6-176  
 relations of popes and emperors, 6-†208  
 why called "Holy," 6-208
- Holy-water bucket**, 13-\*78
- Holyhead**, Wales, lighthouse, 10-\*226
- Holyoke**, Mass., industries, 8-173
- Holyrood House**, Edinburgh, 6-\*120
- Holzschuher, Heronymus**, portrait by Dürer, 11-\*209
- Homage**, act of fealty, 5-293; 6-20
- Home accidents**, 2-426
- Home industries**, of New England, 8-55
- Home Insurance Building**, Chicago, 11-518
- "Home Means Nevada,"** song, 8-234-B
- Home medicine cabinet**, first aid articles, 2-402
- Home rule in Ireland**, 6-160  
 Gladstone's fight for, 12-443
- Homer**, life and works, main article, 13-†27-30  
 bust, 13-\*29  
 heroes of, in Dorian art, 11-34  
 quoted, 11-34; 12-2, 14-409  
 stories by, 5-151, 157; 13-493-  
   Iliad and Odyssey, 5 152
- Homer, Winslow**, life and art, 11-370, 377  
 "High Tide," painting by, 11-\*368  
 "The Gulf Stream," painting by, 11 \*368  
 "The Lookout—All's Well," color plate, 11-\*361
- Homestake Mine**, S. Dakota, 8-361; 9 \*394-95
- "Homestead,"** painting by Benton, 11-\*392-A
- Homestead Act**, U. S., 7-279, 285
- Homing pigeon**, 4-\*13, \*79
- Honduras**, country, Cent. America, description, 7-46-47; general data, 7-48-A  
 area, 7-48-A  
 climate, 7-48-A  
 flag, color plate, 14-following 570, no. 31  
 government, 7-48-A  
 location, 7-48-A  
 mahogany, 9-258  
 map, 7-598  
 merchant marine, number, 10-232  
 mixture of peoples, 7-43  
 part of Central America, 7-41  
 people, 7-48-A  
 physical features, 7-48-A  
 rivers, 7-48-A  
 sarsaparilla from smilax, a native plant, 9-219-A
- Honduras, British**, *see* British Honduras
- Honduras, Gulf of**, Central America, map, 7-598

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Honey**, 3-313, 314  
 as food  
   anteater's, 4-452  
   bear's, 4-312  
   birds, 4-180  
   insect's, 3-272  
   stored by ants, 3-325  
   secreted by plants, 2-62  
**Honey ants**, 3-325  
**Honeycomb**, 3-\*297  
   stages in formation of, 3-\*312  
**Honey creeper**, bird, 4-\*179  
**Honeybees**, 3-\*271, 274, 300  
   loaded with pollen, 2-\*109, \*113  
   sting, 10-\*489  
   *see also* Bees  
**Honeycomb sponge**, 3-87  
**Honeysuckle** (acanthus), ornament, 11-\*425  
**Hongi**, Maori chief, 5-533  
**Hongkong**, island at entrance to Canton River, China, a British crown colony, 10-265; 5-\*321, \*332  
   coaling station, 10-237  
   given to England, 5-331, 332  
   map, 5-591, M9  
   port, 10-\*240  
**Honiton**, lace, 12-\*169, 172  
**Honolulu**, Hawaiian capital, 8-460  
   location, 8-461  
   map, 8-562  
   rainfall and temperature, 8-461  
   trade, 10-242  
**Honorius III**, pope, and Frederick II, 5-299  
**Honshu**, or **Hondo**, main island of Japan, 5-364-B  
   climate, 5-364-B  
   map, 5-592  
**Hooch**, **Peter de**, paintings, 11-\*267, 268  
**Hood**, **Thomas**, quoted, 9-5  
**Hood**, **Mount**, Oregon, volcanic peak, 1-\*24, 8-\*325  
**Hood and Fouilhoux**, architects of Rockefeller Center, 11-510  
**Hood Canal**, U. S., 8-128  
**Hooded shrimp**, 3-188  
**Hooded snake**, 3-\*485  
**Hoof** of animal  
   antelope, 4-415  
   chamois, 4-425  
   elephant, 4-337  
   giraffe, 4-403  
   horse, 4-350, 506, \*507  
   development, 3-50  
**Hoofed animals**  
   giant, 4-†337-52  
   giraffe and deer tribe, 4-†402-13  
   hog family, 4-†432-39  
   horse tribe, 4-†505-14  
   wild cattle, 4-†390-400  
   antelopes; goats; sheep, 4-†415-30  
**Hooke**, **Robert**  
   discovers cells, 2-6  
   suggests manufacture of artificial silk, 9-83  
**Hooked rugs**, 12-\*157  
   how to make, 14-†79  
**Hooker**, **Thomas Reverend**, 8-56  
**Hookworm**, campaign against, 7-307  
**Hoolock**, gibbon, 4-249  
**Hoop skirts**, 9-\*14, \*17, 20  
**Hoopee**, bird, 4-\*180  
**Hoosac Hills**, in Massachusetts, elevation, 8-176-A  
**Hoosac tunnel**, 10-206  
**Hoosic River**, U. S., 8-283  
**Hoosier poet** (James Whitcomb Riley), 13-337  
**Hoosier State**, nickname for Indiana, 8-116-A  
**Hoosiers**, nickname for people of Indiana, 8-116-A  
**Hoot (horned) owl**, 4-167, \*165  
**Hoover**, **Herbert Clark**, President of the U. S., 12-456-C  
   announces moratorium on war debts, 7-340  
   elected, 7-333, 339  
   portrait, 7-\*339  
   renominated, 7-340  
   service in World War I, 7-324  
**Hoover**, **Lou Henry** (Mrs. Herbert C. Hoover), 12-564  
**Hoover Dam**, 8-234, \*22, \*230; 10-531, †532; 1-370  
**"Hoozer,"** meaning, 8-116-A  
**"Hop o' My Thumb,"** fairy tale, text, 14-†248-49  
**Hop scotch**, game, 14-170  
**Hop sticks**, game, 14-166  
**Hopatcong Lake**, N. J., 8-252  
   resort, 8-249  
**"Hope,"** motto of Rhode Island, 8-347  
**"Hope,"** painting by Watts, 14-\*423  
**Hope**, **Spirit of**, in Pandora's box, 14-424  
**Hopi Indians**, 8-22  
   "piki" bread, 9-239  
   snake dance, 7-96, \*97; 9-\*8  
   stone dwellings, 7-94  
   weaving, 10-\*343  
**Hopkins Esek**, commands colonial naval force, 7-481  
**Hoppi-Copter**, one-man helicopter, 10-\*328-Q  
**Hoppner**, **John**, portraits by, 11-294, \*303  
   "Master Van Dieft," painting, 11-\*303  
**Horace** (**Quintus Horatius Flaccus**), life and poetry, main article, 13-†49-51  
**Horatii**, Alban tribe, 5-\*206  
**Horatius Cocles**, holds bridge over Tiber, story, 12-†340-41  
**Hormones**  
   function in blood stream, 2-357, 361  
   growth of bone cells owing to, 2-324  
**Horn**, musical instrument, 12-258-B  
   Hebrew: shophar, 12-205  
   loudness, 1-450  
   luren, 6-\*405; 12-\*208  
**Horn**, mountain type in physiography, 1-25  
**Horn**, of animal, *see* Horns  
**Horn, Cape**, So. Amer.  
   map, 5-604

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Horn, Cape**—*continued*

post office stones on, 10-85

winds, 10-240

**Horn carving**, 12-95, 99**Horn of Africa**, peninsula in Indian Ocean, 5-457**Hornbill**, bird, 4-193, †194, \*11

color plate, 4-\*185

nest building and breeding, 4-†194

**Horned frog**, 3-426**Horned lark**, bird, 4-223**Horned owl**, 4-167, \*165

color plate, 4-\*152

**Horned palm viper**, 3-†490**Horned parakeet**, bird, color plate, 4-\*232**Horned pout**, catfish, 3-242**Horned rhinoceros**, 4-†346**Horned toad**, lizard, 3-†457-58**Hornemann, Frederick**, Sahara explored by, 5-453**Horner, Mary** (Mrs. Charles Lyell), 13-431**Hornets**, insects, 3-304, \*297

nests, 3-\*296, \*307

**Horns**

antelope, 4-\*395

hollow-horned and solid-horned ruminants, 4-415, \*421, \*423

ibex, 4-\*429

made from skin, 2-290

musical instrument made of, 12-205

of Moses, 11-103

ox family, 4-\*395

rhinoceros, 4-346, †347

sheep, 4-426

**Horny sponge**, 3-†83**Horrocks, Jeremiah**, 1-148**Horsa**, Jutish chief, in England, 6-8, 10-9**Horse**, *see* Horses**"Horse Fair,"** painting by Rosa Bonheur, 11-\*333**Horse family**, 4-350, \*506, 508; *see also* Donkeys;

Horses; Zebras

**Horse latitudes**, 1-225**Horse power**, 10-397**Horse race**, game, 14-160**Horse racing**, Kentucky, 8-137**Horse-radish**, 9-311**Horse sponge**, 3-87**Horsefly**, 3-†360

larva, 3-\*388

**Horses**, main article, 4-†505-14

armor for, 10-352, \*353, \*359

breaking to harness, 4-514

bred in Rhode Island, 8-346

cart horse, 4-\*511, 513

depicted in art, 4-†510; 11-\*3, \*81

painting of three horses' heads, 3-\*67

drawing and mounting, 14-\*63

evolution, 4-\*507

first seen by Mexicans, 7-74

Kentucky, 8-137

leather, 9-70

milk, 9-332

**Horses**—*continued*

mythological, 10-313, \*314; 14-432

earth supported by, 1-\*101, 102

polo ponies, 14-†525

prehistoric, 3-\*50, 51, 54, 57; 4-350, 505, \*507

race horse, 4-\*511, \*512, 514; 10-\*446

race with locomotive, 10-183, \*188

sense of rhythm, 4-514

sense of sound, 2-302

Shetland ponies, 4-\*350, \*508; 6-†486

snowshoes used by, 14-523

thoroughbred, 4-\*511, 514

toes, 4-†506-7

uses, 4-510; 5-87, 99, 100

as mail carriers, 10-\*133

burden bearers, 4-\*506

coal mines, 9-444

harvest field, 9-\*102

lumber camps, 9-\*247, 251

why important for civilization, 5-87

wild, 4-\*349, †350, 514

stampede, 4-\*510

wooden horse of Troy, 13-30

**Horses of Diomedes**, 14-429**Horseshoe bat**, 4-274**Horseshoe Fall**, Niagara River, 1-78**Horseshoe (king) crab**, spider, 3-190, †192

Carboniferous period, 3-30

**Horseshoe magnet**, 1-†487, 488

in telephone, 1-\*518

**Horseshoeing**, 4-\*513**Horsetail, fern ally**, 2-\*91, 92

prehistoric, 3-\*22, 23; 2-\*1

**Horsley, John Callcott**, picture by, 12-\*219**Horticulture**, defined, 13-417**Horus**, Egyptian god, 5-\*54**Hosea**, prophet, 5-126

painting by Sargent, 11-\*364

**"Hospital Sketches,"** by Louisa May Alcott, 13-320**Hospitals**, 7-423

libraries, services to, 10-560

*see also* subhead charities and correction under names of various states where you will find list of important hospitals of each state**Host**, botany

fungi, 2-71, 74

in grafting process, 2-231

partial parasites, 2-56

**Hot-air heating system**, 10-382, \*383, 385**Hot and cold weather**, main article, 1-†206-11**Hot springs**, 1-†32-36

Arkansas, 8-27

Azores, 6-489

evidence of heat inside earth, 1-32, †383

Iceland, 1-32, 34; 6-483, \*485

Yellowstone Park, 1-†33 fol.; 7-406

**Hot Springs National Park**, 8-30-A**Hot-water heating system**, 1-398, 482**Hot Water State** (Arkansas), 8-30-B**Hôtel de Ville**, Ghent, 6-348**Hôtel des Invalides**, Paris, 11-490

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Hotels**, rooms for stock quotations, 7-583  
**Hotspur** (Sir Henry Percy), 6-35  
**Hottentots**, African Negroes, 5-445, 475  
**Houdan**, breed of chicken, 9-350  
**Houdon, Jean Antoine**, art style, 11-286  
   sculptures, 11-286  
     Benjamin Franklin, 11-284  
     George Washington, 11-284  
     Voltaire, 11-284, 286; 13-120  
**Hounds**, dogs, 4-493 fol., 503  
   used in fox hunting, 4-303  
**Hourglass**, 10-461, †462  
   timepiece of ancient astronomers, 1-100  
**Hours**, mythological maidens, pictured with  
   Apollo, 1-109  
**Hours, Book of**, Flemish paintings, 11-104,  
   105, †192, 193  
**"Hours of Exercise in the Alps,"** by John  
   Tyndall, 13-390  
**Housatonic River**, U. S., rises in Berkshires in  
   Massachusetts, flowing south through Con-  
   necticut to Long Island Sound, length,  
   10-255  
   Connecticut, 8-62  
**House boats**, of ancient Rome, 5-232  
**House finch**, 4-135, †132  
   color plate, 4-88  
**House flies**, 3-357 fol.  
   enlarged, 2-12  
   head, 3-273  
**House of Burgesses**, America's, *see* Burgesses,  
   House of  
**House of Commons**, *see* Commons, House of;  
   Parliament  
**House of Delegates**, Maryland, 8-162-A  
**House of Lords**, *see* Lords, House of; Parliament  
**"House of Mirth, The,"** by Edith Wharton,  
   13-346  
**House of Representatives**, *see* Representatives,  
   House of  
**House of Shells**, Salamanca, 12-36  
**"House of the Dead, The,"** by Dostoevsky,  
   13-94  
**House of the Seven Gables**, Salem, Mass.,  
   13-299  
**"House of the Seven Gables, The,"** by Haw-  
   thorne, 13-300  
**House of the Tragic Poet**, Pompeii, 12-110  
**House sparrow**, *see* English sparrow  
**Household arts**, main article, 14-†51-57, †71-88  
**Houses**  
   American  
     Colonial, 11-†502-8  
     earliest, 11-†495-99  
     four-family units, Columbus, Ohio, 6-561  
     Indian, 7-3, 317  
     Balkan, 6-364, 365, 367  
   building materials, 9-†375-86  
   cardboard, how to build, 14-10  
   controlling temperature in, 1-476, 477; 10-385  
   Czechoslovakian, 6-358

**Houses—continued**  
   decoration: carving; paneling, 12-107  
   first made of wood in Europe, 11-397  
   Greek, 12-178; in Athens, 5-169-70  
   half-timbered, 11-491  
   lake dwellers of Switzerland, 5-34, 35; 9-†46  
   Maori, 5-536  
   Norwegian, 6-†385  
   on stilts, 13-496  
   on wheels, 1-335, 336  
   primitive, 11-†395-99  
   Roman, 5-228; 12-179  
     Pompeii, 5-257, 259, 260; 11-434  
   roofs of dirt and bark, 6-385  
   skyscraper apartments, 9-385  
   Sumerian, 5-76  
   thatched, 5-536  
   tree houses, 11-396, 397  
   woven, 5-527  
   *see also* Cottages, Huts; Shelter  
**Houses of Parliament**, London, 6-78  
**"Houses of Parliament,"** painting by Monet,  
   11-346  
**Housing**, 7-448, 449  
   in Machine Age, 11-516  
   New York Zoning Law, 11-517, 524  
   slum clearance, 9-385  
   *see also* Shelter  
**Houston, David F.**, portrait, 12-549  
**Houston, Sam**, life, main article, 12-†514-16  
   at Battle of San Jacinto; president of Texas,  
   7-235, 236, 8-375  
   deposed, 8-381  
   portrait, 12-214  
   rebels against Mexico, 7-83  
**Houston, Tex**  
   City Hall, 7-392  
   industries, 8-385  
**Houston Ship Canal**, 8-386  
**Housz, Ingen**, research in botany, 2-50  
**Hovas**, African tribe, 5-464  
**Hovenweep National Monument**, 8-52-B  
   cliff dwellings, 5-21  
**Hover fly**, 3-364  
**Hovey, Richard**, poet, 13-578  
**"How Plants Behave,"** by Asa Gray, 13-412  
**"How Plants Grow,"** by Asa Gray, 13-412  
**How to make things**, *see* Things to make  
**Howard**, recaptures stagecoach, 10-88  
**Howard, Catherine**, wife of Henry VIII, 12-393  
**Howard, Charles** (Baron Howard of Effing-  
   ham), playing bowls with Drake, 12-403  
**Howard, John**, English philanthropist, 6-85  
**Howard, John F.**, song by, 8-404  
**Howard, Joseph E.**, music by, 8-220-A  
**Howard, Sidney**, dramatist, 13-354  
**Howard, Thomas**, Earl of Surrey, *see* Surrey,  
   Thomas Howard, Earl of  
**Howe, Elias**  
   invents sewing machine, 10-443; 9-61  
   portrait, 10-442

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Howe, Joseph**, reform hero of Nova Scotia, biography, 13-567-69
- Howe, Julia Ward**, life and works, main article, 13-†316-17  
 portrait, 13-†317
- Howe, Louis McHenry**, 12-555-D
- Howe, Samuel Gridley**, 13-317
- Howe, William**, viscount  
 in Revolutionary War, 7-167, 169, 170  
 receives commissioners of colonies, 12-†479
- Howe truss bridge**, 10-443
- Howells, William Dean**, life and literary work, main article, 13-†331-32  
 and Mark Twain, 13-331  
 friend of Henry James, 13-336  
 Hamlin Garland, friend and follower, 13-346  
 portrait, 13-†331
- Howitzer**, cannon, 10-368
- Howler monkey**, 4-†264, †265-66
- Howling dervishes**, 5-108
- Hrothgar**, King, in Beowulf legend, 14-319
- Hrozny, Frederic**, deciphers cuneiform, 5-115
- Hsia dynasty**, China, 5-316
- Hsien Feng**, Chinese emperor, 5-333
- Hu Shih**, writing reforms, 5-336
- Huallaga River**, Peru, source, 5-518-D
- Huang Ti**, Chinese emperor, 5-315
- Huascán**, *see* Huascarán
- Huascarán**, mountain peak, South America, 5-518-D
- "Hub,"** nickname for Boston, 8-176
- Hubbard**, association with Alexander Graham Bell, 10-111
- Hubbard, Mabel** (Mrs Alexander Graham Bell), 10-111
- Hubbard squash, vegetable**, 9-†151
- Hubert de Burgh**, *see* Burgh, Hubert de
- Huckleberry**, 9-156, 159
- "Huckleberry Finn,"** by Mark Twain, 13-328, †330
- Hudson, Henry**, voyages and discoveries:  
 death, main article, 13-†475-77  
 Hudson River explored by, 13-†475, 477;  
 7-†135  
 in Delaware, 8-64
- Hudson Bay, Canada**  
 discovered, 13-477  
 maps, 7-593, 590
- Hudson Bay Company**, and Oregon settlement, 8-326; Strathcona works for, 13-564-65
- Hudson Bay region**, won by England, 7-7
- Hudson River**, New York State, 10-†256; 8-283  
 canal connecting with Lake Champlain, 8-403  
 discovery and exploration, 13-†475, 477;  
 7-135  
 fisheries, 9-368  
 George Washington Memorial Bridge, 10-†213  
 New Jersey, 8-252  
 Palisades, 8-268  
 pier, 8-†268
- Hudson River—continued**  
 tunnels under, 10-†206  
 Holland Tunnel, 1-†460-62; 10-†202, 207
- Hudson seal**, 7-33-N
- Hudson Strait**, No. Amer., maps, 7-593, 590
- Hudson Valley**, 8-269
- Hudson's Bay Company**, story of, 10-138  
 explorers in, 13-497  
 relations with Northwest Company, 7-19  
 rival of American Fur Company, 7-231  
 sells Rupert's Land to Canadian government, 7-23
- Huenfeld, Guenther von**, aviator, portrait, 10-†324
- Huerta, Victoriano**, 7-87  
 Wilson's refusal to recognize, 7-316
- Huet, Thomas**, co-author of Welsh Bible, 6-140
- Huffman, Lula M.**, song by, 8-92-B
- Huggins, Sir William**, discoveries in light, 1-171
- Hugh Capet**, king of France, 6-169
- Hughes, Charles Evans**, presidential candidate, 7-320
- Hughes, David Edward**, makes improvements to telephone, 10-113
- Hughes, W. Morris**, Australian premier, 5-560-A
- Hugo, Victor**, life and works, main article, 13-†125-26  
 "Les Misérables," 2-290  
 portrait, 13-†125
- Huguenots**, French Protestants  
 Catherine de' Medici's relations, with 6-†174-75, 177  
 Edict of Nantes, 6-179  
 revocation of, 6-184  
 exiled from France, 6-†182  
 massacre of St. Bartholomew, 6-†175, 177  
 persecuted by Fleury, 6-186  
 Richelieu destroys political power, 6-180  
 settlement in New France not permitted, 7-140  
 South Carolina settlement, 8-349
- "Huguenots, The,"** opera by Meyerbeer, 12-253, 258-D
- Hui Tsung**, painting by, 5-†326
- Hula dance**, 8-457
- Hull, Charles**, mansion becomes "Hull House," 12-581
- Hull, Cordell**, secretary of state, 7-343
- Hull, Jonathan**, steamboat invented by, 10-†219, 220
- Hull, Lizzie Chambers**, song by, 8-212-B
- Hull, Eng.**, industries, 10-254  
 map, 6-572, F3
- Hull, of ship**, 1-†471
- Hull House**, founded by Jane Addams, 12-580-81; 7-†433
- Human body**, *see* Anatomy; Body; Physiology
- "Human Comedy, The,"** by Balzac, 13-128
- Human sacrifice**  
 Aztec, 7-91  
 Mexican, 7-71 fol.  
 practiced by Fijians, 5-527
- Humanitarian movement**, 7-436

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Humber**, river, England, map, 6-572  
**Humbert I**, king of Italy, 6-309  
**Humboldt, Freidrich Heinrich, Alexander, Baron von, life and studies**, main article, 13-422-23  
 portrait, 13-\*422  
 \* river named after, 8-231  
**Humboldt Current**, 5-518-19  
**Humboldt Lake**, Nevada, 8-231  
**Humboldt River**, Nevada, 8-231, 234-A  
**Humboldt's penguin**, bird, 4-\*218  
**Hume, David, life and works**, main article, 13-16-17  
 friendship with Adam Smith, 13-17, 20  
**Humidity**, 1-240, 376  
 effect upon health, 1-241  
 measurement, 1-393  
 relative, 1-393  
**Humming-bird hawk moth**, 3-290, 292  
**Humming birds**  
 nest building and breeding, 4-142, 178  
 North American, 4-141-42  
 pollen carried by, 2-112  
 resemblance to butterfly, 4-30  
 ruby-throated, 4-\*29, †30  
 tropical, 4-†177-78  
**"Humor and Humanity,"** by Leacock, 13-580  
**"Humoresque,"** by Anton Dvořák, 12-256, 310  
**Hump**, of camel, 4-398  
**Humpback bridge**, near Covington, Va., 10-\*212  
**Humpback whale**, 4-\*443  
**Humphrey**, buys first locomotive, 10-179  
**Humphrey, Leonard**, recognition of Emily Dickenson, 13-322  
**"Humphrey Clinker, The Expedition of,"** by Smollett, 13-191  
**Humphrey's Peak**, extinct volcano, 8-24  
**"Humpty Dumpty,"** nursery rhyme, text, color plate, 14-174-1  
**Humus**, in soil, 1-97  
**Hun**, *see* Huns  
**"Hunchback of Notre Dame, The,"** by Victor Hugo, 13-†126  
**"Hundley,"** Confederate submarine, 10-308  
**Hundred Days**, Napoleon's last adventure, 6-197, 12-\*431  
**Hundred Years' War**, 6-†26-28, 35, 170, 174-76  
 Agincourt, 6-35, 174  
 archery, 6-27  
 causes, 6-26  
 Crécy, 6-27, 172  
 Joan of Arc, 12-†386-90  
**Hundredmoot**, Icelandic council, 6-419  
**Hung Hsiu-ch'uan**, Chinese rebel, 5-332  
**Hung Wu** (Chu Yuanchang), Chinese emperor, 5-329  
**"Hungarian Dances,"** by Brahms, 12-302  
**Hungarian Pla'n**, Hungary, 6-290-B  
**Hungary**, country, Europe, **description and history**, main article, 6-†277-90; general data, 6-290-B  
 agriculture, 6-290-B  
 area, 6-290-B  
**Hungary—continued**  
 celebration of millennial birthday, 6-\*286  
 climate, 6-290-B  
 common people  
 festivals, 6-\*287, \*289  
 laws to aid, 6-285  
 Maria Theresa's rule, 6-284  
 revolutions, 6-288, 290  
 taxation and revolt, 6-280, \*281  
 costumes and customs, 6-\*284, \*287-89; 9-\*2, \*23  
 districts, 6-288  
 fascism, 13-2  
 flag, color plate, 14-following 570, no. 32  
 government, 6-290-B  
 history, 6-†277-90  
 Austro-Hungarian Monarchy formed, 6-271, 288; *see also* Austria  
 Maria Theresa's appeal to the Diet, 6-\*256  
 revolution of 1848-1849, 6-269, 270, 285  
 rule of the Hapsburgs, 6-282-86, 288  
 since World War I, 6-288  
 wars with Turks, 6-\*280, †281-82  
 location, 6-290-B  
 maps, 6-587, 570  
 music and musicians, 12-246, †297, *see also* Germany, music and musicians  
 people, 6-290-B  
 physical features, 6-290-B  
 products and industries, 6-290-B  
 agriculture, 6-\*285, \*287  
 coal, 6-290-B  
 fisheries, 6-\*289  
 flour making process, 9-234  
 opal mines, 9-433  
 vineyards and wine, 6-287  
 racial ancestry, 6-277  
 rivers, 10-259  
 Roumania acquires slice of, 6-360  
**Huns**, people, character, 5-270  
 and Byzantine rulers, 5-289  
 Helvetia, 6-246  
 invasion of Europe, 5-270; 6-277, 424  
 invasion of India, 5-372  
 repulsed by Chinese, 5-321  
**Hunt, Holman**  
 paintings, 11-319  
 "Christians Escaping from Druid Persecution," 6-\*110  
 "The Light of the World," 11-\*316, 320  
**Hunt, Leigh**, association with Keats, 13-231  
**Hunt, Richard M.**, 11-514  
**Hunt, Walter**, invents sewing machine, 10-443  
**Hunt, Wilson G.**, portrait, 10-\*101  
**Hunter, John, life and work**, main article, 13-†364-65  
 portrait, 13-\*365  
**Hunter (beetle)**, 3-334  
**Hunter (horse)**, 4-\*511, 514  
**Hunter's moon**, 1-128  
**Hunting**, 4-518  
 animals taught to aid in, 4-\*284, 296

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Hunting**, animals taught to aid in—*continued*  
   dogs' use of sight or scent, 4-501  
   use of hawks, 4-155  
   big game, in Africa, 5-458, \*460  
   big game, in India, 5-\*368  
   by Indians, 7-99  
   by prehistoric man, 5-24, 28  
   fox hunting for sport, 4-†303, \*498  
   Poland, 6-\*453
- Hunting animals**, game, 14-151
- Hunting spider** (mygale), 3-410, 411
- Huntingdon, Earl of** (Robin Hood), 14-354
- Huntington, Archer M.**, museums, 8-418-A
- Huntington, Daniel**  
   painting showing leaders in Atlantic Cable enterprise, 10-\*101  
   portrait, 10-\*101
- Huntington, W. Va.**, industries, 8-435
- Hunton, Mehitable**, cousin of Mary Baker (Eddy), 13-556
- Huntsville, Texas**, home of Houston, 12-516
- Hunyadi, John**, victory over Turks, 6-281
- Hunyadi, Matthias**, *see* Matthias I of Hungary
- Hurdle races**, 14-471, †472, 474
- Hurley**, Irish hockey, 14-523
- Huron, Lake**, North America  
   area, 8-186-A  
   connection with Lake Superior, 10-274  
   discovery, 7-3  
   map, 7-595
- Huron Indians**, 8-270  
   New York, 8-270  
   Ohio, 8-305
- Huron Island Bird Refuge**, 8-186 B
- Huron Mountain**, Michigan, 8-186 A
- Huronian period**, geology, 1-40
- Hurricanes**, 1-230  
   in Galveston, Tex., disaster of 1900, 1-72  
   in West Indies, 7-64
- "Husher,"** meaning, 8-116-A
- Husky**, *see* Eskimo dog
- Huss, John**, life and preaching, main article, 13-†536-37; 6-\*259  
   betrayed, 6-212  
   burned, 6-263
- Hussites**, religious sect, persecution of, 6-211, 259, 263, 281
- Hutchinson, Anne**, one of Portsmouth's founders, 8-344
- Hutchinson, Kansas**, industries, 8-130
- Hutia**, tree rat, 4-\*385
- Huts**  
   African Zulus, 5-\*479  
   built over water, 5-526  
   Eskimo, 1-196; 13-497; 7-36; 6-483, \*484  
   grass, 8-457, \*458  
   medieval, 5-301, \*303  
   Neolithic Period, 5-34  
   Swiss lake dwellers, 5-\*34, \*35; 9-†46  
   thatched, 6-\*121; 7-\*51; 8-\*463
- Huts—continued**  
   wattle-work, 12-†129, 130  
   *see also* Shelter
- Hutten, Ulrich von**, crowned with poet's laurel, 6-\*211
- Hutton Lake Migratory Bird Refuge**, 8-454-A
- Huxley, Thomas Henry**, biography, main article, 13-437-38  
   association with John Tyndall, 13-390  
   portrait, 13-\*438
- Huygens, Christian**, life and work, main article, 13-377  
   clock made by, 1-292; 10-466  
   portrait, 13-\*377  
   theory of light, 1-†415-16, 417
- Hveen**, observatory of Tycho Brahe, 6-414
- Hwang** (Yellow) river, China, 5-336-A, 55  
   basin area, 10-257; length, 10-253; map, 5-591  
   flood in ancient times, 5-316
- Hwang Tsi**, Chinese emperor, 12-41
- Hyacinth and Apollo**, mythology, 14-442
- Hyades**, star group, star maps showing:  
   Jan. and Feb., 1-178-B  
   March and April, 1-178-D  
   Nov. and Dec., 1-178-L  
   Sept. and Oct., 1-178-I
- Hyaenodon**, prehistoric animal, 3-52
- Hyatt, John Wesley**, 10-552
- Hybridism**, crossbreeding, 2-233 13-416  
   Burbank's experiments, 13-417  
   Mendel's law, 13-†414-15  
   mule, 4-\*506
- Hyde Park**, London, 6-\*94
- Hyde Park Agreement** (1941), U. S. and Canada 7-29-D
- Hydra of Lerna**, myth, 14-428
- Hydraulic mining for gold**, 9-394
- Hydraulic press**, 7-†545; 1-†368
- Hydria**, Greek jar, 12-50
- Hydrochloric acid**, in stomach, 2-356, 9-413
- Hydrogen**, element, 1-538  
   air contains, 1-377  
   atomic structure, 1-\*541  
   component of petroleum, 9-450  
   component of water, 1-†363 64; 13-378  
   freezing point, 1-\*392  
   in hydrogen bomb, 1-558-H-559  
   in sun, 1-559  
   lightest substance in world, 1-473, 555  
   nitrogen combined with, 10-546  
   obtained by electrolysis of water, 1-557, 558  
   speed of molecules, 1-359  
   symbol, atomic no. and wt., 1-\*551  
   uses: gas refrigerator, 1-409, 410  
   balloons and dirigibles, 1-473; 10-314, 319
- Hydrogen bomb**, 1-558-H-559
- Hydrogen chloride**, *see* Hydrochloric acid
- Hydrogen sulphide in eggs**, 9-357
- Hydrogen thermometers**, 1-391
- Hydroid corals**, in Silurian period, 3-18
- Hydroids**, *see* firs and jellyfish, 3-†104-14

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text



- Hydrometer**, measures specific gravity, 1-†474  
**Hydrophobia**, vaccination against, 13-368  
**Hydroplane**, of Glenn Curtiss, 10-†316  
**Hydroponics**, *see* Soilless gardening  
**Hydrozoa**, sea creatures, alternation of generations, 3-109  
**Hyena**, animal, 4-†307-9  
     Pliocene period, 3-57  
**Hygelac, King**, in Beowulf legend, 14-319  
**Hygiene**, *see* Health; Physiology  
**Hygrometer**, measuring instrument, 1-276  
**Hyksos**, rule of, in Egypt, 5-61  
**Hymns**  
     early Christian, 12-211  
     origin in Hebrew chants, 12-205  
     of Arthur Sullivan, 12-319  
**Hymns**—*continued*  
     Puritan attitude toward, 12-257  
**Hynson, George B.**, composer of lyric to "Our Delaware," 8-66-A  
**"Hypatia,"** by Charles Kingsley, 13-247  
**"Hyperion,"** by John Keats, 13-231  
**Hyphae**, of fungi, 2-57, \*71, 72  
**Hypocotyl**, of plant, 2-126  
**Hypodorian mode**, musical scale, 12-208, 215  
**Hypogeum at Hal Saflieni**, Malta, 6-†475  
**Hyposulphite of soda**, use in photography, 10-451  
**Hypothesis**, defined, 1-4  
**Hyrax**, animal, 4-†345  
**Hywel the Good**, Welsh king, and Welsh law code, 6-138
- I**
- I. W. W.**, *see* Industrial Workers of the World  
**"I came, I saw, I conquered,"** Caesar's message, 12-359  
**"I Love You, California,"** song, 8-42-B  
**I pack my trunk**, game, 14-156  
**"I put my faith in virtue, not in arms,"** 8-206-B  
**Ianthina**, sea snail, 3-148  
**Iberians**, people  
     civilization, 6-318  
     Scotland, 6-111  
     Spain, 6-342-B  
**Iberville, d', Pierre le Moyne, Sieur**, Canadian officer, founder of Louisiana, 8-141  
     Mississippi, 8-201  
**Ibex**, goat, 4-†423, \*428, †429  
**Ibis**, bird, 4-†147-48  
     African wood ibis, color plate, 4-†184  
     Oligocene period, 3-53  
     scarlet ibis, 4-†11  
**Ibsen, Henrik, life and works**, main article, 13-86-88  
     and the theater, 13-87-88; 12-333  
     influence, 13-88  
     plays acted by Eleonora Duse, 12-333  
     portrait, 13-†87  
     rival of Björnson, 13-87, 88, 98, 99  
**Icarus**, mythology, attempt at flying, 10-313, \*314; 11-416; 14-448  
     story of, by Peter Breughel, 11-†190, 202  
**Ice**  
     airplane hazard, 10-328 R  
     dry ice, 10-519  
         how made, 1-†406, 409  
     food preservation with, 10-515, 516  
     harvesting and preservation of, 10-†515, \*516  
     houses made of, 11-†398  
     lighter than water, 1-472  
     manufacture, 10-515, \*517  
     mixed with salt, 9-414  
     pressure converts snow into, 1-59  
**Ice**—*continued*  
     temperature, 1-155, 406  
     why it floats, 1-483  
     why no one can skate on, 14-519  
     yield to pressure; movement, 1-59  
**Ice Age**, *see* Glacial (Pleistocene) epoch  
**Ice boat**, how to make, 14-†32  
**Ice boxes**, 10-518  
**Ice cream**, a dairy product, 9-338  
**Ice floes**, 13-†494, \*498  
**Ice hockey**, 14-†524  
     Stanley Cup, trophy, 14-524  
**Ice-making plant**, 1-†356  
**Ice sheets**  
     Alaska, 1-†197  
     boulders moved by, 3-3  
     effects of, 1-†62, \*63  
     Paleozoic era, 3-34  
     Pleistocene period, 3-59, 60  
     vegetation on, 2-195  
     *see also* Glacial epoch  
**Ice storm**, 1-251  
**Icebergs**  
     broken from Greenland's glaciers, 6-482  
     detection and end of, 1-64  
     formation, 1-59, 63  
     reason for floating, 1-472  
     shattering of, 10-†418  
     soundings for, 1-242  
**Iceland**, island, No. Atlantic Ocean, **description and history**, main article, 6-†418-20, 483; *see also* index World War II, 6-493  
     Althing, parliament, 6-†418, 419, 420  
     birds, 4-202, 205  
     Black Death; other calamities, 6-420  
     caves, 1-86  
     education, 6-†419  
     flag, color plate, 14-following 570, no. 33  
     **history**, 6-†418-20  
     viking colony, 10-166

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Iceland, history—continued**

- subject to Norway, 6-419
- Constitution, 6-419
- under Denmark; wins home rule, 6-420
- freed by Denmark, 6-416, 420
- hot springs, 1-32, 34; 6-483, \*485
- maps, 6-598; 13-502-A
- on map of World, 5-573
- physical characteristics, 6-418, 483
- religious history, 6-419, 420
- trade, 6-420
- woman suffrage granted, 12-572

"Iceland Fishermen," by Pierre Loti, 9-365

Iceland moss, 2-80

Icelandic literature, 6-419-20

Eddas, 6-420

Volsunga Saga, 6-420; 14-310

modern writers, 6-420

"Ichabod," by Whittier, 13-307

Ichthyornis, prehistoric bird, 3-43

Ichthyosaur, prehistoric reptile, 3-40

disappearance, 3-47

Icing plants, on boats, 10-518

Icon, religious image, *see* Ikon

Iconoclast, Emperor Leo the first in history, 5-406

Icoscope Camera, 10-\*125

Ictinus, architect of Parthenon, 11-421

"Idaho," origin of name, 8-92-B

Idaho, state, U. S., description and history, main

article, 8-†86-92; general data, 8-92-A-92-B

agriculture, 8-88, †89, \*90, 91; 7-\*460

area, 8-92-A

capital and capitol building, 8-\*86

charities and corrections, list, 8-92-A

cities, towns, list, 8-92-B

climate, 8-92-A, 91

chinook (a wind), 1-231

counties, list, 8-92-B

Craters of the Moon National Monument, 7-417, \*418

education, 8-92

institutions of higher learning, list, 8-92-A

flag, 8-92-B

fur trade, 8-88

holidays, 8-92-B

Indians, 8-89

reservations, 8-92-B

location, 8-92-A

map, 8-488

on United States map, 7-594

monuments, 8-92-A

motto, 8-92-B

name, 8-92-B

nicknames, 8-92-B

parks, 8-92-A

Yellowstone National Park, 7-406

physical features, 8-92-A, 87

political facts, 8-92-A

products and industries, 8-†89 fol.

railroads, 8-91

reservations, game and bird, 8-92-A

**Idaho—continued**

Snake River, geologic formation of, 1-76

state bird, 8-92-B

state flower, 8-92-B

state song, 8-92-B

water power, 8-92

Idaho, Territory of, 8-89

Idaho, University of, building, 8-\*87

Idaho potatoes, 8-\*89, 91; 7-\*460

Ideas, defined, 13-8

builders in

Alexander Hamilton, 12-507

Thomas Jefferson, 12-503

Descartes' theory about, 13-13

Ideographs, Chinese picture writing, 10-†37; 5-327

invention, 5-315

Ides, calendar, 10-482

"Idiot, The," by Dostoyevsky, 13-95

"Idiot of Coria," painting by Velasquez, 11-257

"Idiot's Delight," by Robert Sherwood, 13-355

"Idler, The," by Dr. Johnson, 13-193

"Idomeneo," opera by Mozart, 12-268

"Idylls of the King," by Tennyson, 14-378

Igloo, dog, with Commander Byrd, 13-\*511

Igloos, Eskimo, 6-†484; 9-\*379, 11-\*398

Igloos of eggshell, how to make, 14-†13

Ignatius, Saint, *see* Loyola, Ignatius de, Saint

Igneous rock, 1-11, 19

in Great Dike, Colo., 1-\*38

structure, 3-2, 1-40

Igorots, people, 5-570, \*563, \*565

Iguanas, lizards, 3-†451

Ikhnaton (Amenhotep IV), king of Egypt,

reign; influence upon art, 11-16

most remarkable of pharaohs; his religion, 5-64

Ikon, religious image, 11-\*80, 81

"Il Duce," Mussolini's title, 6-\*309; *see also* Mussolini, Benito

"Il Penseroso," poem by Milton, 13-167

"Il Trovatore," opera by Verdi, 12-300

Ile-aux-Coudres, Quebec, ancient windmill at, 7-\*8

"Iliad, The," by Homer, 13-27 fol.

in Dorian art, 11-34

iron mentioned in, 12-2

life of period reflected in, 5-152

Sam Houston's favorite book, 12-\*514

Iliads, wandering tribes of Persia, 5-106

Illini Indians, 8-96; Illinois River named after, 8-106-A

Illinois, state, U. S., description and history,

main article, 8-†94-105; general data, 8-106-106-B

agriculture, 8-102

area, 8-106

boundary lines, 8-97

capital and capitol building, 8-\*94

charities and correction, list, 8-106

cities, towns, list, 8-†101, 104-5, 106-B

climate, 8-106

counties, list, 8-106-A

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Illinois—continued**

- education, 8-105
- institutions for the promotion of culture, list, 8-106
- institutions of higher learning, list, 8-106
- flag, 8-106-A
- Glacial Age, 1-61
- history, 8-96-102
  - admitted to Union, 8-97
  - Civil War, 8-102
- holidays, 8-106-A
- Indians, 8-96, 98
- location, 8-106
- map, 8-491
  - on United States map, 7-595
- Mormons, 8-99-100
- motto, 8-106-A
- name, 8-106-A
- nicknames, 8-106-A
- parks, 8-106-A
- physical features, 8-95, 106
- political facts, 8-106
- population's growth, 8-98
- products and industries, 8-102-4
  - stock, 8-\*99, \*100
- reservations—game and bird, 8-106-A
- rivers, 8-106, 95
- slavery question, 8-98, 102, 209
- state bird, 8-106-A
- state flower, 8-106-A
- state song, 8-106-A
- transportation, 8-100
- "Illinois," song, 8-106-A
- Illinois, University of, 8-95, 105
  - library, 8-\*95
- Illinois Monument, Ga., 7-\*413
- Illinois River, Ill., 8-106
  - canal connecting with Lake Michigan, 8-101
  - exploration, 13-487
  - name, 8-106-A
- Illinois Territory, 8-97
- Illinois Waterway, 8-101; 10-266
- Illipe Oil, 9-312
- Illiteracy, Middle Ages, 5-301
- Illuminated manuscripts, 6-146; 9-\*274
  - Irish, 11-†84
- Illuminating gas
  - manufacture, 9-444; 10-390, \*391
  - municipal supply, 7-399
  - uses
    - for lighting, 10-390
    - in aircraft, 10-314, 315, \*319
- Illumination, *see* Lighting
- Illustrations, book, printing of, 10-†55
- Illyrians, original inhabitants of Bulgaria, 6-368-A
- "I'm from Missouri and you've got to show me," quotation, 8-212-B
- Images
  - inverted, 10-†449, \*450
  - obtained with lenses, 1-†433-34

**Images—continued**

- prohibited in Greek Othodox churches, 5-407
- stone, on Easter Island, 5-\*520, 521, 529
- Imagists, group of poets, 13-349
- Imatra Rapids, Finland, 6-464-B
- Imhotep, Egyptian divinity, 5-52, 54, 70, 155
- Immigration
  - Argentina, 5-515
  - labor organization hampered by, 7-559
  - South African problem, 5-490
  - U. S., 7-282, 283
    - immigrants before Civil War, 7-†242 fol.
    - inspection at Ellis Island, 7-\*338
    - "quota" system, 7-337
- Immigration and Naturalization Service, 7-378
- Immigration laws, 7-337
- Immortality, peacock symbol for, 11-74
- Immortality of soul, Socrates' belief in, 13-6
- Immortals, term for Greek gods, 14-406
- Impatiens (touch-me-not), seed dispersal, 2-214
- Impeachment, 7-271
  - text of Constitution concerning, 7-184
  - trial of Andrew Johnson, 12-456-D
- Imperial Canal, Mexico, to be replaced, 8-42
- Imperial Conference, Canada, 7-29-A
- Imperial Dam, Ariz., 8-42
- Imperial Diet, Japan, 5-364-B
- Imperial Post of the Emperor Maximilian, 10-86
- Imperial (Praetorian) Guard, Rome, 5-235
- Imperial Preference tariff plan, 7-27
- Imperial python, 3-\*495
- Imperial Valley, California, irrigation, 1-254; 10-532
- "Imperium in Imperio," former motto of Ohio, 8-312-B
- Impeyan silver pheasant, bird, 4-\*189
- Impost, in arch, 11-\*428
- Impressionism
  - art, 11-344-48, 380
  - music, 12-253, 318
  - writing of Sherwood Anderson, 13-351
- Impressment of seamen, 6-91; 7-208
- "In Abraham's Bosom," drama by Paul Green, 13-355
- "In Cupid's workshop," 14-581
- "In God We Trust," Florida's motto, 8-76-A
- "In Memoriam," overture by Arthur Sullivan, 12-320
- "In Memoriam," poem by Tennyson, 13-250
- "In Strange Seas," painting, 14-\*534
- "In the Days of the Inquisition," picture, 6-\*449
- "In the Garden," painting by Brush, 11-\*356
- "In the Midst of Life," short story by Ambrose Bierce, 13-346
- Inagua, islands of Bahamas, 7-53
- Inanimate and animate things, difference between, main article, 2-†278-80
- Incandescence, caused by heat, 1-†373

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Incandescent electric lamp**, 10-†392, \*393  
 invention, 13-443  
**Incas**, Indians of Peru, So. Amer., 5-495; 7-†91-92, \*118  
     centers of Inca civilization, 5-518-D  
     communistic government, 7-92  
     dress, 5-\*497  
     message bearers, 10-30  
     sailboat, 10-\*159  
     Spanish conquest, 5-497; 7-118  
     stone ruins, 5-\*503  
     wool growing, 4-399  
**Incense**, 9-299; 5-458  
**Incense burners**, 12-\*21, \*57  
**Inch**, unit of measure, 10-374  
**Inchworm**, 3-293  
**Incisors**, teeth, 2-\*314  
**Inclined plane**, mechanics, 1-\*325, \*326, 331  
     Galileo measures speed of moving bodies on, 1-295  
**Income**, economics  
     from production, 7-537  
     how expended chart, 7-547  
**Income tax**, U. S., 7-369, 376  
     made legal, 7-315  
**Incubator**, 9-\*351, 355, \*356, 357  
**Indehiscent fruits**, 2-122  
**Indentured servants**, in American colonies, 7-152; 8-409  
**Independence, Mo.**  
     Mormons in, 8-211  
     starting point of westward migrations, 7-232  
**Independence Day**, observation of, 14-585  
**Independence Hall**, Philadelphia, 7-\*361; 11-\*503  
     cut-glass chandelier, 12-36  
     Declaration of Independence read at, 7-\*165  
     room in which Declaration of Independence was signed, 7-\*195  
     signing of the Constitution in, 7-\*176  
**Independence Hall National Museum**, Philadelphia, 7-361  
**Independent Artists**, Salon of the, 11-349  
**Independent Treasury** (Subtreasury) System devised, 7-228  
**Independents**, English political party, 6-66, 127  
**"India,"** meaning of word, 8-116  
**India**, country, Asia, **description and history**, main article, 5-†365-87; general data, 5-387-A  
     age and romance, 5-387  
     agriculture, 5-\*372, \*385  
         bamboo, 2-180  
         cereals, 9-120  
         cotton, 5-371; 9-27, 32; 10-403, 404  
         irrigation, 10-533  
         jute growing, 9-\*285, 310  
         mango cultivation, 9-194  
         peanut export, 9-199  
         rice growing, 9-†108-11  
         spices, 9-209  
         sugar, 9-116

**India**, agriculture—*continued*  
     tea growing, 9-135, 137, †138  
     tobacco, 9-223  
     animal life, 4-394  
         bats, 4-275-76  
         bears, 4-318  
         birds, 4-180  
             hornbill, 4-194  
             kite, 4-157  
             parakeet, 4-192  
             peacock, 4-†188, \*191  
             tailor bird, 4-183  
         boars, 4-432  
         caraculs, 4-296  
         cattle tribe, 4-\*393, 394, \*395  
         cheetahs, 4-296  
         civets, 4-296  
         crocodiles, 3-436, \*437, 440-42  
         deer and deer tribe, 4-\*402, \*409, †412-13, \*474  
         dholes, 4-306  
         elephants, 4-†340-43  
         fish found in rivers, 3-233  
         hyenas, 4-309  
         jackals, 4-302  
         kinsfolk of the deer  
             antelope, 4-\*416, \*418, \*419, 420  
             wild goat, 4-430  
         leopards, 4-292  
         lions, 4-\*287  
         lizards, 3-448  
         mongooses, 4-296  
         monkeys, 4-255-57  
         rhinoceroses, 4-\*345, \*346, 347  
         shrews, 4-281  
         slow loris, 4-269  
         snakes, 3-483, 485-87, \*490, 494  
         squirrels, 4-†367, 368  
         tigers, 4-\*289  
         tortoises, 3-472  
         wolves, 4-302  
     animals sacred to  
         cattle, 5-\*368  
         cow, 5-384  
         white bull, 4-394  
         cobra, 3-\*485  
         monkey, 4-†255, 394  
         peacock, 4-188  
     animals used as beasts of burden, 4-394; 10-\*133  
     area, 5-387-A  
     army trained by Wellington, 12-433  
     art and architecture  
         Buddhist and Greek influences, 5-370  
         greatest glory: Peacock Throne, 5-375  
         ivory carving, 5-\*374  
         mosques and temples, 11-†453  
             Taj Mahal, 11-†450; 5-\*366, 375; 9-†432; 12-114  
             temple carvings, 12-102, \*103  
     basketwork boats, 12-134  
     banyan tree, 2-\*35

The asterisk (\*) refers to picture and its explanation only. The ob-lish (†) refers to illustrated text.

**India—continued**

- birthplace of Aryan languages, 10-4
- caste system, 5-368
  - reflected in costume, 5-378, \*384
- climate, 5-387-A, 336-C
  - hard on Europeans, 5-386
- Constitution, 5-387
- cotton gin, earliest, 10-404
- education, 5-386
- first diamonds from, 9-429
- flag, color plate, 14-following 570, no. 34
- flour mill, 9-\*235
- government, 5-387-A
- history, 5-†366-87
  - until 1707, 5-†366-79
    - Hindu rule, 5-367-72
    - earliest traders, 5-377-79
    - empire of Guptas, Rajput rule, 5-372
    - Greek invasion and influence, 5-370
    - first empire founded; house of Chandragupta, 5-370-72
    - invasions of Tamerlane and Baber, 5-374
    - Mogul empire, 5-374-75, 378-80
  - after 1707, 5-379-87
    - Hindu conquests and rebellion, 5-379, 381, 384
    - East India Companies in, 5-378, 379, 382, 383
    - Seven Years' War extended to, 5-381; 6-80
    - British rule; struggle for independence, 5-385; 6-533-34, 556
    - relations with England, 6-106, 5-387
    - gains independence, 5-387; World War II, 5-387
- industries, *see below subhead* products and industries
- land of mystery, 5-366
- language and literature, 5-367, 369
- location, 5-387-A
- maps, 5-587, 580
- Mogul emperors' jeweled armlets, 12-120
- Mohammedan conquest, 5-372
- native customs, 5-†367-74, †378 fol; 10-\*133
  - costume, 5-\*378, \*384
- people, 5-387-A
  - Parsees, 5-106
- philosophers, 5-366, 369
- physical features, 5-366, 387-A
- probable home of Indo-Europeans, 5-44
- problem of Indians in South Africa, 5-490-91
- products and industries, 5-387-A
  - citrus fruits native to, 9-172, 175
  - coal, 9-438
  - ebony, 9-258
  - indigo dye, 9-305
  - pearl fishing, 3-163
  - perfume manufacture, 9-301
  - rubber plant, 9-263
  - rubies, 9-431
  - salt, 9-412
  - silk industry, 9-37

**India, products and industries—continued**

- silver, 9-389
- teak, 9-258
  - see also above subhead* agriculture
- provinces, 5-387-A
- races, 5-367
- rainfall, 5-387-A; 1-254, \*255
- religion, 5-368, 369, 372
- rivers, 5-387-A
- route to, found by Da Gama, 7-113; 13-460
- search for new routes to, 7-112, 135; 10-167; 13-462, 504
- trade
  - boycott of British goods, 5-387
  - during empire of Guptas, 5-372
  - European traders, 5-375, 378, 386
  - export products, 10-237
    - peanuts, 9-199
  - street fair, 5-\*373
  - transportation, 10-263
  - treatment of women, 5-383
- India leaf butterfly**, 3-283
- India-rubber plant**, 9-263
- Indian architecture**, *see* India, architecture; *see also* Indians, American, architecture
- Indian crafts** (American)
  - Aztec god of, 7-91
  - basketry, 12-128, 130, †131-34, †135; 7-†93, 96, \*106; 10-\*343
  - modern, 8-261
  - pottery, 12-†47, 130; 5-\*495; 7-†90, 93, 96
  - Pueblo Indians, 8-260
  - sewing, 10-\*443
  - stone carving, 7-68, †90
  - weaving, 12-\*135, †140; 7-90; 10-\*343, \*345
  - wood carving, 12-†96, 7-90, †98, \*99; 8-\*11
- Indian chief**, headdress, color plate, 7-frontispiece
- Indian corn**, *see* Corn
- Indian fig**, cactus, 2-\*167
- Indian file and Indian gift**, origin of terms, 7-106
- Indian giant squirrel** (Malabar), 4-\*367
- Indian giver**, 8-315
- Indian jackal**, 4-†302
- Indian language** (American Indians), 7-108; 10-2
  - contributions to English, 10-15
  - Guarani, 5-518-G
  - state names derived from
    - Arkansas, 8-30-A
    - Dakota, 8-302-A
    - Ohio, 8-312-B
    - possible derivation of "Oregon," 8-332
    - Utah, 8-396-A
  - South America, 5-518-B
- Indian marsh crocodile**, 3-441
- Indian mound builders**, 7-†96
  - Illinois, 8-96
  - Ohio, 8-304
  - preserved in monument, 8-312-B
  - West Virginia, 8-432
  - Wisconsin, 8-439
- Indian Mutiny**, 5-384; 6-99

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Indian Ocean**

- coral reefs, 1-57
- map, 5-573
- sea creatures in, 3-85
- size, 1-66

**Indian paintbrush**, plant, 8-454-A**Indian peacock**, bird, 4-\*188, \*191**Indian pipe**, plant, 2-\*56, 58**Indian protectorate**, United States, map, 7-\*206**"Indian Queen, The,"** by Dryden, 13-174**Indian reservations**

- Arizona, 8-24-A
- California, 8-42-B
- Colorado, 8-52-B
- Florida, 8-76-A
- Idaho, 8-92-B
- Iowa, 8-302-A
- Louisiana, 8-146-A
- Michigan, 8-186-B
- Minnesota, 8-198-A
- Montana, 8-220-A
- Nebraska, 8-228-A
- New Mexico, 8-262-A
- New York, 8-284-A
- North Carolina, 8-296-A
- North Dakota, 8-302-A
- Oklahoma set aside for, 8-315, 186-B 317, 320-B
- Oregon, 8-332-A
- Pennsylvania, 8-342
- South Dakota, 8-364-A
- Texas, 8-386-A
- Utah, 8-396-A
- Washington, 8-428-A
- Wisconsin, 8-446-A
- Wyoming, 8-454-A

**Indian River**, Florida, 10-255**Indian shoe**, *see* Lady's Slipper**Indian spotted deer**, 4-412, †413**"Indian Suite,"** by Edward Macdowell, 12-322**Indian summer**, 1-210**Indian Territory**, 8-315**Indian wars** (American Indians)

- Apaches surrender to General Crook, 12-490
  - Black Hawk War, 8-442
- Creek Indian War, 8-6; 12-512
- French and Indian War, 12-475
- King Philip's War, 8-58
- Minnesota, 8-193
- Nez Percés uprising, 8-89
  - Pershing in command against, 12-554
- Sitting Bull's victory over General Custer, 8-218
- uprising in 1763 under Pontiac, 8-306
- wars in West, 7-210, †279-80; 8-451
  - South Dakota, 8-360

**Indian water buffalo**, 4-\*393, 394, \*395**Indian wild boar**, 4-432, \*436**Indian wolf**, 4-302

**Indiana**, state, U. S., description and history,  
main article, 8-†108-15; general data, 8-116-116-B

**Indiana—continued**

- agriculture, 8-115
  - corn production, 9-106
  - effect of World War I on, 7-458
- area, 8-116
- capital and capitol building, 8-112
- charities and correction, 8-116
- cities, towns, list, 8-116-A
  - chief industrial, 8-114
- climate, 8-116
- counties, list, 8-116-A
- education, 8-115
  - institutions of higher learning, list, 8-116
- elevation, 8-110
- farm values, decline after World War I, 7-458
- flag, 8-116-A
- Glacial Age, 1-†61; 8-110
- history, 8-111-13
  - admitted to Union, 8-112
- holidays, 8-116-A
- Indians, 8-110, 112
- location, 8-116
- map, 8-493
  - on United States map, 7-595
- name, 8-116
- nicknames, 8-116-A
- physical features, 8-116, 110
- political facts, 8-116
- population, growth of, 8-112
- products and industries, 8-113 *see also* agriculture *above*
- rivers, 8-110, 116
- state bird, 8-116-A
- state flower, 8-116-A
- state song, 8-116-A
- transportation, 8-†113

**Indiana University of**, building, 8-\*109

## founded, 8-115

**Indiana Land Company**, 8-116**Indiana Territory**, 8-112

## Wisconsin, 8-442

**Indianapolis**, Ind., 8-108

## industries, 8-114; 9-236

## map, 8-493, E5

## Soldiers' and Sailors' monument, 8-\*110

## temperature, 8-116

## World War I Memorial, 8-111

**Indians, American**, main article, 7-†89-108

## agriculture, 7-451

## alpacas raised by Incas, 4-399

## corn, 9-104; 13-\*476

## domestication of plants, 7-123

## irrigation, 7-93

## rice gathering, 9-\*108

## vegetables grown by, 9-148

## wool growing, 4-399

## Alaska, 8-10, 12, \*14

## architecture, 7-90, †92 fol.

## arrowheads, 10-\*350

Aztec civilization, 7-†70-76; *see also* Aztecs

## beads worn by, 12-\*118

## before the king and queen of Spain, 13-\*453

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Indians, American—continued**

- boats, 10-<sup>\*</sup>136, †137, <sup>\*</sup>159; 14-509
- basketwork boats, 12-<sup>\*</sup>130
- canoes, 10-138; 7-<sup>\*</sup>99
- burial of dead, 7-92, <sup>\*</sup>94, †96
- calendars, 10-<sup>\*</sup>477, <sup>\*</sup>478, <sup>\*</sup>479
- Canada, 7-10; 11, <sup>\*</sup>15, 17
- celebrate first Thanksgiving Day, 14-<sup>\*</sup>587, 588
- Central America, 7-†41 fol.; 10-<sup>\*</sup>478, <sup>\*</sup>480
- Cherokees, 8-6; *see also* Cherokee Indians
- chieftain, in full color, color plate, 7-frontispiece; 7-<sup>\*</sup>33-†
- civilization, 5-43
- communication by runners, 10-30
- Cooper's stories about, 13-296
- costume, 9-<sup>\*</sup>5, <sup>\*</sup>8, <sup>\*</sup>21
  - footwear, 9-57, <sup>\*</sup>60, <sup>\*</sup>64
  - full dress, 7-frontispiece, <sup>\*</sup>89, <sup>\*</sup>108
  - headdress, 9-frontispiece, <sup>\*</sup>93, <sup>\*</sup>94
  - Incas, 5-<sup>\*</sup>497
  - Navajo, 8-261
  - Pueblo, 8-<sup>\*</sup>250
- council, 7-<sup>\*</sup>204
- crafts, *see* Indian crafts
- Croatian; blue eyes, 8-286
- customs
  - babies' heads flattened, 8-328
  - claws worn as necklace, 4-315
  - duties of men and squaws, 7-99
  - pamphlets about customs and crafts, 14-550
  - rites and ceremonies, 7-†92 fol.; 8-261, 262-B
- dancing, 7-†96, <sup>\*</sup>97, 104
- deadly drink made by, 2-253
- dwellings, 7-†93 fol.; 9-†376, <sup>\*</sup>386
  - cliff dwellings, 7-421
  - long houses and palisade, 7-<sup>\*</sup>3, 99; 8-269
  - Montezuma Castle, 7-417
  - wigwam, 11-<sup>\*</sup>397
- dyes made by, 9-305; 12-133
- education, 8-260, 417
- Eskimos racially related to, 7-35, 98
- fire-making, 10-<sup>\*</sup>330, 332, <sup>\*</sup>333
- Five Civilized Tribes, 8-320-B
- Five Nations, 8-269
- food, 8-328
  - California Indians, 8-36
  - corn grinding, 13-476
  - dried seeds, 2-200
  - flour and bread making, 9-†239
  - method of cooking, 10-<sup>\*</sup>331
  - preservation of, 9-<sup>\*</sup>227, 326
  - sahuaro fruits, 2-253
  - tapioca, discovery and preparation, 9-211
  - see also* Indians, agriculture
- government's provision for, 7-33-1, 378; *see also* Indian reservations
- Houston's friendship for, 12-514-16
- Incas of Peru, 5-495; 7-†91; *see also* Incas
- Injustice of treatment to, 8-315
- Inter-Tribal Indian Ceremonial, 8-262-B
- Iroquois, 8-269-71
- lacrosse originated by, 14-†493

**Indians, American—continued**

- land sales
  - Albany, 7-<sup>\*</sup>130
  - Kentucky region, 7-214
  - Manhattan Island, 7-128, <sup>\*</sup>131
  - Oklahoma, 8-317-18
- language, *see* Indian language
- leather tanning, 9-<sup>\*</sup>68
- legends and superstitions, 7-91, 94, 100, 102
  - Hiawatha, 8-270
- Lenni-Lenape, 8-64
- masks, 7-98, <sup>\*</sup>100, <sup>\*</sup>107; 12-96, <sup>\*</sup>98
- Mayas, 7-†90-91; *see also* Mayas
- medicine men, 7-96, 100; 8-<sup>\*</sup>441
- message bearers, 10-30
- Mexico, 7-†68-76
  - and the Catholic church, 7-80
  - founded by Cortes, 13-†468, 469
  - lands taken from, by Diaz, 7-86
  - under Spanish rule and later, 7-78
- mineral springs, knowledge of, 8-26
- missionaries to, *see* Missionaries, *subhead* to the Indians
- mound builders, *see* Indian mound builders
- music, 12-257
- musical instruments, 12-<sup>\*</sup>203
- myths and legends, 7-100
- names for rivers, 7-213
- Navajo rug weaving, 12-†140
- ordeals, 7-106
- picture writing, 10-†36
- pipes; use of tobacco, 9-221
- plains, 7-†233, †277, †279, 280
  - conflicts with western pioneers, 7-132, 216
- Pueblos, 7-†92-97; 8-257, †258; 9-<sup>\*</sup>386
  - preserved in national monuments, 8-262-A
  - today, 8-260
- quinine used by, 9-217
- race, 5-†43, 7-89
  - migration from Asia, 5-†39
- railway builders attacked by, 10-192, <sup>\*</sup>194
- relations with English, 7-141
- relations with explorers and colonists, 7-†121-23, †129 fol.; 13-485-86
  - Captain John Smith, 12-†459
  - Cartier, 13-474
  - Champlain, 13-†482; 7-136
  - Cortes, 13-469, 470
  - De Soto, 13-465
  - Hudson, 13-<sup>\*</sup>476
  - Penn and Treaty of friendship, 12-<sup>\*</sup>461, 462; 7-<sup>\*</sup>133
  - Père Marquette, 13-†483-84
- relations with French, 7-140; *see also* French and Indian War
- relations with frontiersmen
  - Buffalo Bill, 12-573, 574
  - Daniel Boone, 12-470
- forced to leave Georgia, 7-226
- relations with the French, 13-†482; 7-2, 5, 6, †135, 137, 139
- treatment of, by Spanish, 7-78, 86, 118, 119

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Indians, American**—*continued*

- relations with U. S. government, 8-315, 317
- forced into reservations; treatment by government, 7-280
- religion, 7-90, 91, 92, 100
- ceremonial dancing, 7-†96, \*97
- reservations, *see* Indian reservations
- rope made by, 9-283, \*284
- rubber balls, 9-†261
- sewed tray, 10-\*443
- shelter, *see above* dwellings
- Shoshonean family, 8-317
- slavery practiced, 8-328
- slaves in Mississippi, 8-203
- smoke signals, 10-†29
- South America, 5-518-B, \*493, 494, 500, 503, \*504, †511 fol.; 9-217
- treatment by Portuguese, 5-499
- treatment by Spaniards, 5-497, 499
- see also* Indians, Lucas
- statue, 14-\*562
- Toltec civilization, 7-†68-70
- totem poles, 7-\*17, †98, \*105; 8-\*11; 12-†96
- trails, 10-150, 153
- transportation methods, 10-\*128, \*132; 7-\*99, \*104, 136
- river travel, 8-304
- see also* Indians, boats
- treaties
  - Penn's treaty, 7-\*133
  - signing treaty, 7-\*131, \*209
- voting, North Dakota, 8-302-A
- warfare, 7-104
- wars, *see* Indian wars
- weather forecasting, 1-264
- West Indies, 7-51, 53, 56, 58, 64, 66
- woodcraft, 14-562, 567
- woven cradle, 12-\*135
- see also names of various tribes of Indians, as*
- Dakota Indians, and also subhead Indians*
- under names of states*
- Indigo bunting bird**, color plate, 4-\*24
- Indigo dye**, how obtained, 2-20; 9-305
- Indigo snake**, eggs, 3-\*497
- Indium**, symbol, atomic no. and wt., 1-\*551
- Indo-China**, Asia, description, 5-429-30
- archaeology, 5-19
- Federation of, 5-430-B
- mandarin boot, 9-\*54
- maps, 5-581, 588
- trade, 10-237
- World War II, 5-430; 6-564
- Indo-European (Aryan) languages**, 5-367; 10-4
- Indo-European (Aryan) people**, 5-†43-45
- first appearance in history, 5-97, 99
- India, 5-367
- migrations, 5-44; language spread by, 10-4
- Indo-Iranian languages**, Asiatic language group, 5-336-D
- Indonesia, United**, republic, 5-†523-25, 529-B; 6-564
- flag, color plate, 14-following 570, no. 35

**Indoor games**, *see* Things to do

- Induced current**, 1-\*502, 504
- Induction**, magnets produced by, 1-487
- Induction**, of electricity, 1-502, 506
- Induction**, logic, 13-152
- Induction coil**, use in radio, 10-116
- Induction motor**, 1-\*528
- Indulgence, Declaration of**, issued by James II of England, 1687, 6-128
- Indulgences**
  - Luther's attack on sale of, 13-543
  - Reformation started over sale of, 6-212
- Indus River**, India
  - basin area, 10-257
  - length, 10-253
  - map, 1-70
  - outlet, 5-387-A
- "Industrial and Commercial Geography,"** by J. Russell Smith, 7-578
- Industrial arbitration**, 7-562, 563
- Industrial arts**, *see* Crafts
- Industrial chemistry**, 10-\*544, 545-46, \*547, \*548, 550
- Industrial commission**, Wisconsin, 8-445
- Industrial Conciliation and Arbitration Act**, New Zealand, 5-540
- Industrial Revolution**
  - England, 6-†84-95
  - New Hampshire affected by, 8-239
  - Scotland, 6-132
  - "Second Industrial Revolution," 7-566; 8-240
  - United States, 7-217, 241
  - far-reaching effects; Gilded Age following Civil War, 7-276-77, 281 ~~82~~ 289
  - immigrant workers, 7-244
  - trusts, 7-308
- Industrial schools**, *see under names of various states* subhead education, institutions of higher learning
- Industrial union**, compared with craft union, 7-562
- Industrial Workers of the World (I.W.W.)**, 7-310, 334, 562
- Industrialization**, 7-560
- Industry**
  - census of manufactures, 7-379
  - demobilization after World War I, 7-331
  - development in England, 6-84
  - government regulation and control, 7-543, 549
  - labor union, 7-540
  - mobilized during World War I, 7-324
  - process, developed by chemistry, 10 548
  - United States, 7-343-F
  - home industries; New England, 8-55
  - see also* Corporations; Economics; and also names of industries, as Coal; Iron
- Indy, Paul d'**, French composer, opinion of César Franck, 12-254
- Inertia**, physics, 1-†306-12
- Infantile paralysis**, treatment at Warm Springs, 8-84

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Infantry**, in modern warfare, 10-367, 7-477  
**Infants**, necessity for crying, 2-287  
 soft spot in skull, 2-324  
**Infection**, white blood corpuscles fight, 2-350  
 fought by drugs, 9-219-A, 219 B  
**Inflation of currency**, 7-508  
**Inflorescence**, unfolding of blossoms, 2-158  
**Influenza**, virus injected into eggs, 2-\*13  
**Infra-red rays**, 1-419; 10-494  
**Ingolstadt**, Germany, gate, 11-\*468  
**Ingots**, steel, 9-\*404, \*406-07  
**Ingrain carpet**, 12-161  
**Ingres, Jean Auguste Dominique**, 11-327-28  
 leads classical movement in France, 11-327  
 made leader of Academy painters, 11-328  
 paintings by, 11-325  
 "Madame Riviere," 11-\*324  
 portrait of himself at twenty four, 11-\*335  
 "The Apotheosis of Homer," 13-\*29  
**Inheritance**, Mendel's studies of, 13-†413-15  
**Inheritance tax**, U. S., 7-376  
**Inhibitory center of heart**, 2-377  
**"Inini,"** Indian word, 8-106-A  
**Initiative**, government, 7-312  
 South Dakota, 8-364  
**Injuries, first aid treatment**, 2-†399-412  
**Ink**  
 how made, 9-307  
 sepia, 3-171  
 used for invisible writing, 14-143  
**Ink bag**  
 of octopus, 3-168, 169  
 of squid and cuttlefish, 3-171  
**Inlaid linoleum**, 10-550  
**"Inland Empire,"** section of Oregon, 8-325  
**Inland Sea**, Japan, 5-364 B  
**"Inland Voyage, An,"** by Stevenson, 13-265  
**Inland waterways**, main article, 10-†252-68  
 Tennessee River, 8-368  
*see also* Rivers, Streams  
**Inlay**, art  
 furniture, 12-176 fol.  
 ancient, 12-27  
 gold, 12-82  
 oriental, 12-\*99, 102  
*see also* Mosaics  
**Inn**  
 colonial, 11-\*501  
 Elizabethan, 6-\*53; 12-328  
**Inn River**, Europe  
 Austria, 6-265  
 map, 6-586  
**Inner Mongolia**, China, 5-437, 438  
**Inness, George**, paintings, 11-368  
 "Peace and Plenty," painting, 11-\*365  
**"Innocence,"** painting by Greuze, 11-\*285  
**Innocent III**, pope, 5-299; 6-298  
**Innocent X**, pope, portrait by Velasquez, 11-253, 257  
**"Innocents Abroad,"** by Mark Twain, 13-330  
**Innsbruck**, Austria, French defeated at, 6-269  
**Inuit**, name for Eskimos of America, 8-15

**Inoculation**  
 against smallpox, 13-365  
 against typhoid, 14-556  
**Inquisition**, 5-284  
 India, 5-378  
 Italy, 6-302, 306  
 Portugal, 6-341  
 Spain, 6-327 fol.  
 founded by Isabella, 6-323 \*  
**Insane institutions**  
 asylum, 7-\*441  
*see also* subhead charities and correction under each state for list of institutions  
**Insanity**, treatment of, 7-\*441, 443  
**Inscription Rock**, El Morro National Monument, 7-\*418, 419  
**Inscriptions**, cuneiform, *see* Cuneiform inscriptions  
**Insect-eating mammals**, 4-†271-82, †450-57  
**Insect-trapping plants**, 3-\*271, \*274  
**Insecticides**, 3-355  
**Insectivorous plants**, 2-†60-64  
**Insects**, main article, 3-†269-404  
*(see also* Contents Volume 3 *for chapter headings)*  
 anatomy  
 antennae, 3-287, \*294, 320  
 ears, 3-\*346, 376  
 eyes, 3-†273, 279, 358, 397  
 legs, 3-273, \*305, \*346, †397 fol.  
 mouth parts, 3-\*305, \*313, 320, 390, \*397, 402  
 of "perfect" insect, 3-273  
 proboscis, 3-280, 290, \*291, 358  
 sense organs, 2-392, 3-273, 279, \*346, 348  
 wing cases, 3-329, †330, \*341, 345, 349  
 wings, 3-273  
 bees, 3-299  
 beetles, 3-329, †330, \*341  
 butterfly, 3-281, 287  
 flies, 3-357  
 leaping insects, 3-346  
 moth, 3-287  
 straight-winged insects, 3-354, 370  
 breathing of insects, 3-274, 365  
 water insects, 3-394, 397, 400, 401  
 bug a special kind, 3-370  
 caterpillars, 3-277, \*278, \*282, \*283, 287, \*290 fol., \*322, 373, \*381  
**chirping and leaping**, 3-†345-49  
 cocoons, 3-288, \*289, †382, 389  
 color plates, 3-\*270, \*278, \*279, \*294, \*342  
**consumed by plants**, 2-†60-64  
 disease carriers, 2-18, 388; 3-360, 365; 5-461  
 eggs and hatching  
 bee, 3-300, 312, \*314, 315  
 beetle, 3-335  
 apple tree borer, 3-†343  
 boll weevil, 3-339  
 scarab, 3-332  
 scavenger, 3-†401  
 butterfly, 3-277, \*278

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Insects, eggs and hatching—continued**

- cicada (locust), 3-**\*371**, 372
- cricket, 3-349
- fly, 3-**†358**
- gnat, 3-360
- mosquito, 3-360, **†363**
- wasp, 3-306
- flowers' methods of attracting or repelling, 2-163

half a million kinds: destruction by birds, 4-9

how spiders differ from, 3-406

illumination by phosphorus, 3-343

**injurious**

- army worm, 3-373
- cockroaches: earwigs, 3-355
- flies, 3-**†357-65**
- locusts and cicadas, 3-**†367-73**, **\*376**
- mosquitoes, 3-**†360-63**; 2-388
- termites, 3-**†374-78**
- tsetse fly, 3-365; 2-18; 5-461

**injurious and beneficial**

beetles, 3-**†330-43**

butterflies, 3-282

larva, *see* Larva stage

main classes (*see also* entries under main subjects listed below)

ants, 3-**†320-27**

bees, 3-**†297-304**, **†309-18**

beetles, 3-**†329-43**

butterflies, 3-**†276-84**

cicadas, 3-**†370-73**

flies, 3-**†357-65**

dragon fly, 3-384

fly destructive to orange crop, 9-171

lacewing fly, 3-381-83

fresh-water insects, 3-**†386-404**, 360, **\*363**, 384

locusts, 3-**†345-48**, **†367-71**, **\*376**

mantids, 3-349-51, **\*355**

mosquitoes, 2-388; 3-**†360** fol.; 10-270

moths, 3-**†286-94**

silkworms, 3-288, **\*289**; 9-**†38-41**; 13-368

termites, 3-**†347-78**

wasps, 3-304-7, **\*298**, **†296**, 9-273

*see also* names of species, as Ant Lion; Army worm

metamorphosis of, 3-279-80

**migratory**

ants, 3-326

army worm, 3-374

butterflies, 3-281, 282

cicadas, 3-370

locusts, 3-367

termites, 3-379

moulting, 3-277, 280, **\*347**, **†348**, **†373**, **†388** fol.

**nest-building habits**

ants, 3-**†320**

bees, 3-298 fol.

termites, 3-**†374**

wasps, 3-**†304** fol.; 9-**†273**

number of species, 3-269

**Insects—continued**

nymph stage in growth, 3-**\*274**, 372, 388, **\*389**

paralyzed by wasps, 3-**\*398**, 307

**plant enemies**

destroyers of cotton, 9-**†33**, 34

plant lice, 3-282, 324, **†325**, 335, 365, 382

plant galls caused by, 2-138

plant lice destroyers, 3-282, 335, 365, 382

pollen carriers, 3-**\*271**, 272, 313, 318; 2-**†106-12**, 145, 163

prehistoric, 3-18, 29, 39, 53, 64

appearance in Cenozoic period, 3-**\*18**

fossilized in amber, 3-**\*18**, 53

**protective devices**

beetles, 3-337

butterflies, 3-283

caterpillars, 3-293

leaf insects, 3-351, **†352**

mantids, 3-349-51, **\*355**

moths, 3-292

stick insects, 3-351, **†352-54**

pupa stage, *see* Pupa stage

scavengers, 3-331, 400

scent production, 3-283, 337, 355, 381, 398

**social life**

ants, 3-321; 2-392

bees, 3-299

termites, 3-376

wasps, 3-304, 306

sound production, 3-292, 337, 345-49, 372, 403

stick and leaf resemblances among insects, 3-351, **†352-54**

Instinct in animals, 2-393

"Institutes of the Christian Religion, 13-548

Instruments, *see* Astronomical instruments;

Musical instruments, etc.

Insular possessions, U. S., *see* United States, subhead insular possessions

Insulating board, materials used, 9-**\*294**

Insulation, gutta-percha used for, 9-309

**Insulators**

electricity, 1-514, 515

glass brick in building, 10 548

heat, 1-396, **\*405**

**Insulin**

diabetes remedy, 10-550

effect upon sugars in body, 2-361

**Insurance**

Hartford, home of, 8-61

unemployment, 7-544

England, 6-102

Insurance commission, Wisconsin, 8-445

Intaglio, carving, 12-103, 122

Intaglio printing, 10-**\*65**

Intake stroke, of automobile, 10-**†282**

Intarsiatura, wood mosaics, 12-114

Intef, Egyptian ruler, 5-59

Intellectuals, Molière's comedy ridiculing, 13-112

"Intelligence of the Flowers, The," by Maeterlinck, 2-189

Intercollegiate Foils Championship matches, 14-512

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Interdependence**, main article, 7-†564-78, 552

**Interest**

on loans, 7-517

on savings accounts, 7-516

**Interferers**, in football, 14-518

**Interglacial epochs**, 3-60

**Interior, Department of**, U.'S., 7-377, 470

National Park Service under, 7-405

view of building, 7-446

Virgin Islands governed by, 8-474

**Interior highland**, of United States, 7-343-C

**"Interior of a Dutch House,"** painting, 11-\*267

**"Interior of a Stable, The,"** painting by George Morland, 11-\*311

**Interludes**, short plays, 12-327

**Intermezzo**, music, 12-237

**Internal combustion engine**, invented, 10-278  
Diesel, 10-†276

**International association of working men**,  
founded by Marx and Engels, 7-550

**International bankers**, 7-511

**International Chamber of Commerce**, 7-576

**International Committee of the Red Cross**, 7-428

**International Court of Justice**, 6-355

**International Date Line**, 10-†470-72

**International Economic Conference**, 1933, 7-342

**International exchange**, main article, 7-†510-14  
affected by price of cotton, 9-29

**International friendship**, 5-45; *see also* League of Nations; Peace and peace movement

**International Harvester Company**, 10-413

**International language**, *see* Universal language

**International law**, science of, founded, 13-168

**International organizations**, Switzerland, 6-254

**International Peace Park**, Alberta, 7-29-V

**International Phonetic Association**, alphabet, 10-45

**International Postal Union**, 10-91

**International trade**, 7-†571-78

cooperation essential, 7-574

merchant marine, 10-†231-42

modern transportation important, 10-224

payments, 7-†510-14

**International yacht races**, 14-†527-30

**Intersections**, driving precautions, 2-440, 441-42, \*444

**Interstate Commerce Act**, 7-288; 12-456-B

**Interstate Commerce Commission**, 7-381

created, 7-288

Iowa, 8-122

**Inter-Tribal Indian Ceremonial**, 8-262-B

**Intertype**, typesetting machine, 10-†53

**Interval**, musical, 12-206

**Intestines**, anatomy, 2-357-58, \*335

digestive juices, 2-357

function, 2-\*352, 358, 367

large intestine, 2-\*335, 358, 367

ring muscle, 2-358

small intestine, 2-\*335, 357-58

tubercular gland, 2-\*347

villi, 2-357, 358

**"Intimations of Immortality,"** by Wordsworth, 13-216

**Intoxicating liquors**

drink made of mescal, 2-253

legislation against

Canada, 7-29

U. S., 7-†335

**Intracoastal Waterway**, 8-295, 356; 7-343-D

along the Gulf, 8-386

Louisiana and Texas, 8-146

New Jersey, 8-252

**"Intruder, The,"** by Maeterlinck, 13-100

**Intuitive geometry**, 10-437

**Invar**, alloy, 1-481

**Invasion**, modern form of, 10-362-68

**Invasion barges**, 6-\*536

**Invention and applied science**, *see* Contents  
Volume 10

agriculture and food, 5-35

canning, 9-†226-31

chemistry's contributions, 10-545

cooking, 10-331

fishing methods, 9-361-64

hunting weapons, 5-28

irrigation projects, 10-†528-33

machinery, *see* Agriculture, machinery

pasteurization, 13-368, \*369

refrigeration, 10-†514-19

changes wrought by, 7-497

chemistry's contributions, 10-†544-50

communication

alphabet, 10-40, 43

cables, 10-†101-6

early methods, 10-†27-32

newspapers affected by, 10-76-78, 81-82

postal service speeded up by, 10-\*84, †91

printing, 10-†47-71

radio, 10-†115-21

telegraph, 10-†94-99

telephone, 10-108-13

television, 10-†123-26

writing, 10-†34-45

contributions of Connecticut, 8-56

economic importance, 7-498-500

effect on industries, 7-577

fire, 10-†330-36

heating, 10-†379-85

industry, *see* Machinery

lighting, 10-†387-93

machine age, 6-84

made Industrial Revolution possible, 6-84

music, 12-201

harmony, 12-215

instruments, 12-202, 203; *see also* Musical instruments

notation, 12-\*212, 213, \*214

rhythm, 12-202

scales, 12-206 fol.

medicine and health

antiseptics, 13-372

pasteurization, 13-368, \*369

vaccination, 13-366

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Invention, medicine and health—continued**

- X ray, 10-493, †494, \*495
- patents on, 7-381
- pottery, 12-41
- porcelain, 12-42
- shelter**, 11-†394-401
  - arch, 11-407, 462
  - buttress, 11-\*463, 468
  - dome, 11-407
  - skyscrapers, 11-516
  - vaulting, 11-455, 462, \*463
- technological unemployment a result, 7-545
- transportation**, 10-†128-311
  - airplane, 10-†312-28
  - automobile, 10-†277-81
  - compass, 10-†454-57
  - locomotive, 10-†175-83
  - sailing ships, 10-†158-73
  - steamships, 10-†216-24
  - submarine, 10-†306-10
  - tunnels and tubes, 10-†202-7
  - wheel, 10-†142-48
- see also* Transportation
- weapons**, 10-†348-68; 5-28
- see also* Engines; Machinery; Science, and names of inventions, as Gyroscope; Spectroscope

**Inventors**

- see names of inventors, as* Edison, Thomas Alva

**Invertebrates**, animals without backbones, 3-68, †69

- prehistoric, 3-9

**Inverted images**, 10-†449, \*450**Investiture**, Henry V's quarrel with pope over, 6-208**Invincible Armada**, *see* Armada**Invisible Empire** (Ku Klux Klan), 7-272**Invisible ink**, 14-143**Involuntary muscles**, 2-327**Iobates**, king of Lycia, and Bellerophon, 14-445**Iodine**, element, 1-\*551

- in water supplies, 10-542
- isotopes of, in medicine, 1-558-H
- obtained from kelp, 2-69
- South Carolina, iodine-producing plants, 8-356-A

**Iodine State**, nickname for South Carolina, 8-356-A**"Iolanthe,"** operetta by Gilbert and Sullivan, 12-320**Ion**, *see* Ions**Iona**, island, Scotland, 6-\*487, 488

- map, 6-575
- St. Columba's mission, 6-146

**Ionian Greeks**, revolt against Persian rule, 5-160**Ionian Islands**, Mediterranean Sea, 6-477

- currant raising, 6-368-B
- map, 6-595

**Ionian Sea**, Europe, maps, 6-589, 595**Ionic capital**, 11-\*416; 12-\*94**Ionic Order**, 11-†418, 423**Ionium**, radioactive element, 9-425**Ions**, electrified particles, 1-558

- condensation on, 1-241

**Iowa**, state, U. S., **description and history**, main article, 8-†118-23; general data, 8-124-124-B

- agriculture, 8-122
- corn, 8-118, 121, 122
- rainfall, 8-124
- soil, 8-124
- tenant farming, 7-459
- wheat, 8-†120
- area, 8-124
- capital and capitol building, 8-118
- charities and correction, 8-124
- cities, towns, list, 8-120, 123, 124-A
- climate, 8-118, 124
- counties, list, 8-124-A
- education, 8-123
  - institutions of higher learning, list, 8-124
- flag, 8-124-A
- history, 8-119-22
  - admitted to Union, 8-121
  - Civil War, 8-121
  - included in Wisconsin Territory, 8-442
- holidays, 8-124-A
- Indians, 8-119, 120
  - reservations, 8-124-A
- location, 8-124
- map, 8-495
  - on United States map, 7-595
- motto, 8-124-A
- name, 8-124-A
- nicknames, 8-124-A, 120
- physical features, 8-124, 119
- political facts, 8-124
- population's growth, 8-121
- products and industries, 8-122-23
  - button manufacture, 9-51, \*52
  - see also* agriculture *above*
- reservations, game and bird, 8-124-A
- rivers, 8-124
- state bird, 8-124-A
- state flower, 8-124-A
- state song, 8-124-A
- transportation, 8-121
- "Iowa," meaning, 8-124-A
- "Iowa," song, 8-124-A
- "Iowa, Proud Iowa," song, 8-124-A
- Iowa, University of**, 8-119
- Iowa City**, old capitol building, 8-\*119
  - becomes capital, 8-121
  - industries, 8-123
- "Iowa Corn Song," 8-124-A
- Iowa Indians**, 8-119
  - Oklahoma land grant, 8-317
- "Iowa Interiors," novel by Ruth Suckow, 13-352
- Iowa River**, Iowa, 8-124
- Iowa State College**, 8-123
- Ipecac**, 9-219-A
- Iphegenia**, in Greek mythology, sacrifice of, 14-456
  - Euripides' plays about, 13-38

The asterisk (\*) refers to picture and its explanation only. The obeliak (†) refers to illustrated text.

**"Iphigenia in Aulis,"** opera by Gluck, 12-272  
**"Iphigenia in Tauris,"** opera by Gluck, 12-272  
**Iquique,** Chile, trade, 10-241  
**Irak,** *see* Iraq  
**Iran,** official name for Persia, *see* Persia  
**Iran, Plateau of,** Asia, 5-336 B  
**Iraq,** Arab kingdom, Asia, 5-94; general data, 5-336-D  
   boat, 10-\*138  
   excavations in, 5-\*75, \*81  
   flag, color plate, 14-following 570, no. 37  
   life and customs, 5-\*82, \*90, \*94  
   maps, 5-582, 580  
   resources, 5-\*80  
**Irawadi River,** *see* Irrawaddy River  
**Ireland (Eire and Northern Ireland),** main  
   article, 6-†143-62, general data, 6-162-B  
   *see also* index World War II, 6-493  
   area, 6-162-B  
   art and learning, 6-146, 161, 11-84  
   climate, 6-162-B  
   cottages, 6-\*148; 12-130  
   divisions, 6-162-B  
   early Christianity, 6-145  
   education, 6-159  
   emigration caused by potato blight, 2-137  
   flag, color plate, 14-fol. 570, no. 38; 573  
   government, 6-162 B  
   **history,** 6-†143-62  
     to 1485, 6-†143-49  
       druidism, 6-†143  
       kingdoms, 6-144  
       Danish occupation, 6-146  
       conquered by England, 6-148  
   **1485 to the present,** 6-†151-62  
     Protestant colonies planted in Ulster, 6-154  
     Cromwell's conquest of, 6-68; 12-409  
     Cromwell's treatment of, 6-154, 155  
     famine, 6-153, 159  
     union with England, 6-158  
     Home Rule, 6-160; 12-443  
     Gladstone's reforms, 12-443  
     Anglo-Irish War, 6-161-62  
     land reform, 6-160  
     Irish Free State established, 6-162  
     becomes member of British Commonwealth of Nations, 6-166  
     adopts new constitution, 6-162  
   Iceland's first settlers from, 6-418, 419  
   illuminated manuscripts, 11-†84  
   industries, *see* *below* products and industries  
   literature, *see* Irish literature  
   location, 6-162-B  
   map, 6-576  
     on map of Europe, 6-570  
   missionaries  
     Europe, 6-146  
     Scotland and England, 6-9, 146  
     Wales, 6-137  
   monasteries, 6-145; 11-84  
   parliament until 1800, 6-149

**Ireland—continued**  
   people, 6-162-B  
     oratory, gift of, 13-201  
   physical features, 6-162-B  
   potato famine, 2-136  
   potato prevents famine in, 9-143  
   products and industries  
     laces, 12-\*165, \*169, 172  
     linen manufacture, 9-71; 6-162-A  
     meat production, 9-329  
     peat, 9-437  
     sheep raising, 6-\*157  
   rural life, 6-\*148, \*153 fol  
   St. Patrick's work in: his emblem, 6-145; 14-†580  
   snakes driven out, 14-580  
   Swift's aid to, 13-179  
   theater, 12-333  
   trade  
     linen export, 9-48  
     turkey export, 9-359  
**Ireland, Church of**  
   and Protestant kings of England, 6-152  
   relations with Roman church, 6-145  
**Ireland, Northern,** ("The Six Counties"), self-governing unity of United Kingdom, 6-108-B  
   flag, 14-facing \*572  
   map, 6-576  
**"Irene,"** by Dr. Johnson, 13-193  
**Iresine,** plant, 2-55  
**Iridium,** element  
   platinum hardened with, 9-422  
   symbol, atomic no. and wt., 1-551  
**Iris,** goddess, 14-408, 413  
**Iris,** flower, state flower of Tennessee, 8-374  
**Iris of eye,** 2-†296 fol  
   structure and function, 1-436  
**Irish church**  
   Church of Ireland, 6-145, 152  
   in early England, 6-9, 10  
**Irish elk,** 3-\*61  
**Irish Free State,** Great Britain, general data, 6-162-B  
   established, 6-162  
   flag, color plate, 14-facing \*572  
   map, 6-576  
   member of British Commonwealth of Nations, 6-106  
   *see also* Ireland  
**Irish laces,** 12-\*165, \*169, 172  
**Irish literature,** 6-146, 147, 161; 11-†84  
**Irish Moss,** 2-\*67  
**Irish potatoes,** *see* Potatoes  
**Irish Sea,** British Isles, maps, 6-572, 576  
**Irish setter,** 4-\*499-500  
**"Irish Symphony,"** by Arthur Sullivan, 12-320  
**Irish terrier,** 4-\*493  
**Irish water spaniel,** 4-\*499  
**Iron,** main article, 9-†398-408  
   apple skins contain, 9-162  
   blood contains, 9-408; 2-345

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Iron—continued**

- cast iron, 9-401
- combustion, 1-385
- discovery, by Hittites, 5-†114-15
- effect of heat upon, 1-9, 110
- effect upon compass, 10-456
- floats in melted lead, 9-416
- floats in mercury, 1-472; 9-416
- foundry, 5-\*560
- industry
  - Illinois, 8-103
  - Indiana, 8-114
  - Minnesota, 8-196
  - Ohio, 8-\*310, 311
  - Pennsylvania, 8-336
- largest mine, 9-\*399, 408
- magnetism, 1-486, 487
- manufacture of steel from, 9-\*398, †401 fol.
- melting temperature, 1-\*392
- meteorites contain, 1-165, 167
- molecular motion at different temperatures, 1-†380-82
- necessary to form chlorophyll, 2-45
- producing areas, 9-408
  - Elba, 6-474
  - Europe, 6-162-C
  - Newfoundland, 7-32
  - South American deposits, 5-518-B
  - United States, 7-343-E
  - Michigan, 8-185
  - Superior oldland, U. S., 7-343-C
- separation from ore, 9-†400 fol.
- melting centers, 10-260
- stainless steel contains, 9-420
- symbol, atomic no and wt., 1-\*551
- tin can contains, 9-420
- united with oxygen, 1-96
- united with sulphur, 1-552, 553
- uses, 9-408
- warships, 7-482; 10-360; 13-†439
- welding, 12-3
- wrought iron, 9-401
- see also Ironwork; Steel
- Iron, electric, 1-523**
- Iron Age, 9-399; 12-2, 6, 8**
  - beginning of, 5-115
  - remains of, found at Hallstatt, 6-257
- Iron Chancellor (Bismarck), 12-449**
- "Iron chink," machine, 9-\*368**
- Iron clothing, armor, 10-352**
- Iron Duke, see Wellington, Arthur Wellesley**
- "Iron Heel, The," by Jack London, 13-341**
- Iron horse, name for locomotive, 10-187**
- Iron law of wages, 7-559**
- Iron Mountain, Florida, 8-76**
- Iron Mountain, Mo., 8-112-B**
- Iron Mountain State, 8-212-B**
- Iron ore, 9-399**
- Iron oxide (rust), 1-96**
- Iron pyrites, fire made with, 10-\*333**
- Iron spar buoys, 10-\*227**
- Iron Spring, Yellowstone National Park, 1-36**

**Iron sulphide**

- chemical composition, 1-553
- how to make, 1-552
- Iron Tatars, in China, 5-327**
- "Ironclads," ships, in Civil War, 7-483; 13-†439**
- Ironside, Norse law code, 6-419**
- Ironsides, Cromwell's soldiers, 6-66; 12-407, \*408**
- Ironton, Ohio, smelting plants, 8-311**
- Ironwork, main article, 12-†1-10**
  - ancient, 12-†1-3
  - arms and armor, 12-†3 fol.; 10-†351 fol., †352-56
  - decoration and ornament, 12-\*5, †6 fol.
  - early European, 12-\*3, 4, 8
  - Greek and Roman, 12-†2, 3
  - grilles, 12-\*5-7, 8, 10
  - Hallstatt and La Tène Periods, 12-6
  - jewelry, 12-6
  - modern, 12-10
  - money of Sparta, 5-155
  - Renaissance, 12-\*5 fol, 10
  - swords, 5-91, 115
  - wrought iron balconies, 8-\*143
- Iroquois Indians, 8-269-71, 275**
  - attacked by Champlain, 8-270; 7-\*136; 13-†482
  - Indians driven West by, 8-190
  - long houses, 8-269; 7-\*3, 99
  - Ohio, 8-305
  - relations with French, 7-5, 6, †136, 137
  - Revolutionary War, 8-277
  - snowshoes, 9-\*60
  - treaty covering lands, 7-154
- Iroquois League of Indians, 8-269**
- Irrawaddy, or Irawadi River, chief river of Burma, India**
  - length, 10-253
  - map, 5-588
- Irrigation, main article, 10-†528-33**
  - California, 8-40, 42
  - changes in bird life caused by, 4-100
  - Colorado, 8-51
  - cost of; government projects, 10-531
  - government aid, 7-310, \*460
  - Holland's canals, 6-352
  - in district in Western U. S., 7-\*310, \*462
  - modern, 10-\*528, †529-33, color plate, 10-543
  - necessary to dry soil however fertile, 7-465
  - New Mexico, 8-260
  - orchard growing by means of, 9-163, \*164
  - Oregon, 8-329
  - Persia, 5-106
  - primitive, 10-†528-33
  - rice fields, 9-109, †111
  - Russia, 10-261
  - snow and rain supply, 1-\*252, 254
- Irving, Sir Henry, English actor, 12-333**
- Irving, Washington, life and works, main article, 13-†293-95**
  - burial place, 11-505
  - "Knickerbocker's History of New York,"

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Irving, Washington - continued**

- scene from, 7-<sup>\*</sup>149  
 portrait, 13-<sup>\*</sup>294  
**Irving Trust Building**, New York, 11-<sup>\*</sup>519  
**Isgac, sacrifice of**, carvings, 11-<sup>\*</sup>124, <sup>†</sup>125  
**"Isaac Blessing Jacob"**  
 painting by José de Ribera, 11-<sup>\*</sup>247  
**Isaacs**, engineer, early experiment in motion pictures, 10-503  
**Isabel**, daughter of Pedro II of Brazil, 5-509  
**Isabella**, queen of Portugal, Saint, 6-340  
**Isabella**, the Catholic, queen of Castile and León  
 aids Columbus, 13-<sup>\*</sup>448, 450 fol; 7-114  
 Boabdil delivers keys to, 6-<sup>\*</sup>325  
 Columbus takes flag of, to America, 14-573  
 reign, 6-322  
 "Royal Chapel," 12-<sup>\*</sup>7  
**Isabella II**, queen of Spain, 6-333  
**Isabella**, princess of Portugal, John van Eyck's mission to, 11-197  
**Isabella**, princess of Spain, friendship for Rubens, 11-220, 222, 225  
**Isabella**, comedy character, 12-329  
**Isaiah**, prophet, 5-126  
**Iselberg**, Andreas Hofer before battle at, 6-<sup>\*</sup>272  
**Isenheim Altar**, paintings by Mathias Grünewald, 11-<sup>\*</sup>207  
**Ishtar, gate of**, Babylon, 5-95, <sup>\*</sup>97; 11-28  
**Isin**, ancient Sumerian city, 5-80  
**Isis**, Egyptian goddess, 5-154  
**Islam**, meaning of word, 5-416, *see also* Mohammedans and Mohammedanism  
**Island Number Ten**, Mississippi River, bombardment, 7-<sup>\*</sup>262  
**"Island universes,"** of stars, 1-183  
**Islands**  
 Africa, 5-473-A  
 coral, 1-56  
 how they come into being, 1-76; 3-63  
 largest, 5-464  
 mountain formation, 1-27, 28  
**of the Mediterranean Sea**, 6-<sup>†</sup>471-80  
 populated by sea birds, 4-205, 216  
**possessions of United States**, 8-<sup>†</sup>470-74  
 South Seas, 5-526  
 United States, 7-343-C  
 volcanic, 1-29, 76; 5-521, 526, 528; 6-489, 491  
*see also* Atlantic Ocean, islands; Pacific Ocean, islands; West Indies, islands  
**Islands of the Blessed**, 14-424  
**Isle La Motte**, Vt., fort built on, 8-399  
**Isle of Man**, 6-108-B  
 map, 6-572  
**Isle of Pines**, West Indies, 7-56  
**Isle Royale National Park**, Mich., 8-186-B  
**Isles Chausey**, islands, English Channel, 6-488  
**Isleta**, early settlement on Rio Grande, 8-378  
**Isobars**, on weather map, 1-277  
**Isobutylene**, 9-271-B  
**Isosceles triangle**, geometry, 10-<sup>†</sup>439

- Isotherms**, drawn by Humboldt, 13-423  
**Isotopes**, radioactive, peacetime uses, 1-558-H  
**Israel**, ancient kingdom, 5-<sup>†</sup>123-29  
 modern nation, 5-<sup>†</sup>138-41; 6-556, 563-64  
 flag, color plate, 14-following 570, no. 39  
*see also* Hebrews; Jews  
**"Israel in Egypt,"** oratorio by Handel, 12-265  
**Issus, Battle of**, 5-178; 12-349  
 mosaic, 11-54, <sup>\*</sup>56  
**Istanbul**, *see* Stambul  
**"It Can't Happen Here,"** by Sinclair Lewis, 13-351  
**"Italia,"** dirigible, 13-502  
**Italian architecture**, *see* Italy, architecture  
**Italian art**, *see* Italy, *subheads* art; crafts  
**"Italian Landscape,"** painting by Arthur B. Davies, 11-<sup>\*</sup>389  
**Italian language**, *see* Italy, language  
**Italian Legion**, founded by Giuseppe Garibaldi, 12-445  
**Italian literature**  
 biographies, 13-<sup>†</sup>59-71  
**Annunzio, Gabriel d'**, 13-<sup>†</sup>71  
**Ariosto**, 13-<sup>†</sup>65-67  
**Boccaccio**, 13-<sup>†</sup>63-64  
**Dante**, 13-<sup>†</sup>59-61  
**Machiavelli**, 13-<sup>†</sup>69-70  
**Petrarch**, 13-<sup>†</sup>61-62  
**Tasso**, 13-<sup>†</sup>67-68  
*see also names of Italian writers in index*, as Ariosto; Dante; Tasso  
 drama, 12-328, 331  
 the age of Dante, 6-299  
**Italian of the Pacific**, term for Samoan language, 8-467  
**Italian Riviera**, 6-315-B  
**Italian Somaliland**, terr., Africa, map, 5-576  
**"Italian Symphony,"** by Mendelssohn, 12-288  
**Italy**, country, Europe, main article, 6-<sup>†</sup>292-315;  
 general data, 6-315-B  
*see also* Index World War II, 6-493  
 architecture  
 Byzantine, 11-446  
 copied by French, 11-490  
 effect of light on, 11-462  
 Gothic, 11-<sup>\*</sup>465, <sup>\*</sup>467, 476  
 Renaissance, 11-<sup>†</sup>482-86, <sup>\*</sup>487  
 Romanesque, 11-450 fol.  
 area, 6-315-B  
 arms and armor, 10-<sup>\*</sup>353, <sup>\*</sup>355, <sup>\*</sup>359  
 art  
 Baroque, 11-<sup>†</sup>180-88  
 division into two main groups, 11-248  
**Florentine and other artists**, 11-<sup>†</sup>122-47  
**Giotto and contemporaries**, 11-<sup>†</sup>107-20  
 influence upon Flemish artists, 11-202  
**Leonardo da Vinci and Michelangelo**, 11-<sup>†</sup>149-62  
**Raphael**, 11-<sup>†</sup>164-69  
**Venetian artists**, 11-<sup>†</sup>171-88  
*see also* crafts *below*  
 cities, manufacturing, 10-260

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Italy—continued**

- climate, 6-315-B
- common people
  - growth of labor problems, 6-309, 310
  - massacre of French, 6-298
  - under Mussolini, 6-314
- conquest under Mussolini, 7-555
- costume, 6-313
  - of knight, 9-311
  - shoes, 9-54
- crafts
  - bronze and bronzes, 12-12, 20-21, 22, 23
  - carving, 12-94, 101, 181
  - furniture, 12-181, 183, 186
  - glassmaking, 12-30, 31-34
  - goldsmithery and silversmithery, 12-79, 85, 88
  - ironwork, 12-5
  - laces, 12-164-70
  - pottery, 12-56
  - stained glass windows, 12-75, 77
  - tapestry, 12-137, 142
- currency, 6-312, 314
- dawn of literature and art, 6-299, 300
- divisions, 6-315-B
- drama, 12-328, 331
- Fascism, 6-310, 311, 312; 7-554
- first home of Renaissance, 12-32
- flag, color plate, 14—following 570, no. 40
- government, 6-315-B
- history, 6-293-315
  - to 1789, 6-292-303
    - conquered and united by Rome, 5-205
    - barbarian invasions, 6-206; 5-267 fol.; 11-452
    - Roman empire overthrown, 6-293; 5-253
    - Lombard invasion; Charlemagne and successors, 6-294
    - Lombards checked by Franks, 6-168
    - social conditions in 1100, 6-296
    - free cities and republics; trade, 6-292, 296, 299
    - Guelphs and Ghibellines, 6-209, 297, 298
    - Middle Ages, 5-295 fol.
    - Catholic church lays foundation of power, 6-294
    - land governed by popes, 6-466
    - Renaissance, 6-300
    - during time of Machiavelli, 13-69
    - tyrants, 6-300
    - Spanish control, 6-302
- 1789 to present, 6-305-15
  - Napoleon's activities, 12-424, 425, 428; 6-306
  - relations with Austria, 6-270, 271, 275
  - Mazzini's and Garibaldi's activities, 12-444-46; 6-306
  - revolution of 1848, 6-307
  - unification, 6-309; 12-446
  - member of Triple Alliance, 6-273
  - World War I, 6-275, 310

**Italy, history—continued**

- D'Annunzio in the war: Fiume affair, 6-310; 13-71
  - since World War I, 6-310
- radical parties, 6-309, 310, 312
- Fascism, 6-310, 311, 312
- negotiates treaty between Austria and Germany, 6-275
- invasion of Ethiopia, 6-315; 5-461
- efforts to secure Balkan territory, 6-364, 366
  - see also* Rome, ancient, history
- industries, *see below* products and industries
- industry, control of, 7-554
- jewelers, 12-125
- language
  - Tuscan speech becomes national language, 6-299
  - used by Dante, 13-61
- literature, *see* Italian literature
- location, 6-315-B
- maps, 6-589
  - on map of Europe, 6-570
- modern life, 6-313
- music and musicians, 12-219, 259, 299
  - madrigals, 12-220
  - opera, 12-223, 225, 237, 252
  - sacred music, 12-220
- musical instruments: violins, 12-224
- people, 6-315-B
  - in South America, 5-518 B
- physical features, 6-315-B
- plagues, 6-300
- possessions
  - Africa, 5-473-B
    - Eastern Africa, 5-457
    - map showing, 5-444
    - Northern Africa, 5-455
  - Asia, list, 5-336-11
  - Mediterranean, 6-472, 476, 478
- products and industries
  - agricultural products, 6-315-B
  - canning, 9-228
  - cheese, 9-348
  - fishing, 6-315-A
  - hemp, 9-285
  - manufacturing centers, 10-260
  - marble, 9-380
  - mercury, 1-538, 9-417
  - nut growing, 9-202
  - olive industry, 9-213
  - silk, 9-38
- Protestantism resisted, 6-302
- race, 5-39, 44
- rivers, 10-259-60; 6-315-B
- Roman Catholicism the state religion, 6-315
- religious situation today, 7-556
- sirocco (a wind), 1-231
- sunlight, 11-108
- tourists, 6-303
- trade, 6-296-97, 302
  - mercant marine, number, 10-232

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Italy, trade—continued**

transportation of manufactures and products, 10-260

transportation, 10-260

**Itching, treatment for, 2-404****Iturbide, Augustin de, the Terrible, emperor of Mexico, 7-82****Ivan IV (the Terrible), first czar of Russia, character; reign of, 6-\*422, 427**

church built by, 12-\*449-D

**Ivan V, czar of Russia, 6-429****Ivan III (the Great), grand duke of Moscow, 6-426****"Ivanhoe," novel by Sir Walter Scott, 13-222**

Jewish persecution depicted, 5-136

**Iverna, ancient name for Ireland, 6-143****Ives, Chauncey B., statue by, 11-\*375****Iviza, island in Mediterranean Sea, 6-471**

map, 6-591

**Ivory**

babirusa's tusks of, 4-434

imitation, 10-546, 552

sources, 4-344, 448

statue of Athena made of gold and ivory, 12-84

**Ivory, vegetable, sources, 2-129, 255, 256****Ivory-billed woodpecker, 4-69****Ivory carving, 12-\*99, \*101, 105; 11-\*15, \*80**

Austrian, 12-101

Byzantine, 12-\*99, \*101

**Ivory carving—continued**

Chinese, 12-\*97, 98

church decoration and ornament, 12-105, †181

Cretan, 12-102

Egyptian, 12-\*99

Eskimo, 12-96; 7-38; 8-\*14

French, 12-\*101

Greek, 12-103

Indian (East), 5-\*374

Italian, 12-\*181

Japanese, 12-\*97, 100

medieval, 12-105

prehistoric, 4-\*510; 11-\*3

screens, 12-\*97

Syrian, 12-\*99, \*101

**Ivory Coast, colony, W. Africa, 5-470, 473**

map, 5-574

**Ivory nut, vegetable ivory made from, 2-255****Ivoryton, Conn., 8-60****Ivry, Battle of, 6-180****Ivy, Gothic decoration, 12-184****Ivy poisoning, treatment, 2-403****I.W.W., see Industrial Workers of the World****Ixion, punished by the gods, 14-455****Ixtlilxochitl, Indian historian, 7-70****Iyeyasu, Japanese shogun, 5-351**

founds line of Tokugawa shoguns, 5-354

suppresses Christianity; banishes missionaries, 5-356

# J

**Jabiru, stork, 4-195****Jabneh, Palestine, Jewish school at, 5-133****Jaboticaba, tropical fruit, 9-194, 196****"Jack and Jill," nursery rhyme, text, color plate, 14-174-K****"Jack and the Bean Stalk," fairy tale, text, 14-†190-91****Jack-in-the-pulpit, 2-\*150, 151**

effect of light on growth, 2-\*45

**Jack rabbit, 4-386, \*387****Jack screw, 1-\*326****"Jack Sprat," nursery rhyme, text, color plate, 14-174-H****"Jack the Giant Killer," fairy tale, text, 14-†243-44****Jackal, animal, 4-†302**

dogs related to, 4-496

**Jackass penguin, bird, 4-221****Jackknife, diving positions, 14-†537-39****Jackknife bridges, 10-\*211, 214****Jacks of the clock, used before clocks, 10-464****Jackson, Andrew, president of the U. S., life, main article, 12-†511-13, 456-D**

administration, 7-224-27

efforts on behalf of common people, 7-223

**Jackson, Andrew—continued**

exploits; character, 7-221, 223

financial policies, 7-226

friendship with Houston, 12-515, 516

"Hermitage," home in Nashville, 8-\*366

loses presidency to Adams, 7-222

portraits, 7-\*222

reasons for election of, 7-\*222

statue in New Orleans, 8-\*141

upholds Union; ignores Supreme Court, 7-226

wins Battle of New Orleans, 7-211

**Jackson, Thomas Jonathan (Stonewall Jackson), main article, 12-†539**

in Civil War, 7-260

portrait, 7-\*257

**Jackson, Miss., 8-200, 205****Jackson River, U. S.**

helps form James River, 8-418

**Jacksonian democracy, 7-222****Jacksonians, political party, 7-222****Jackson's Hole National Park, 7-409; 8-454****Jacksonville, Fla.**

canal to Port Inglis, 8-72

industries, 8-74

**Jacobean furniture, 12-188**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Jacobins**, French radicals, 6-193  
 English sympathizers with, 13-379
- Jacobite Rebellions**, 6-130
- Jacobs, Helen**, tennis player, 14-470
- Jacquard, Joseph**, power loom, 12-161
- Jacquard loom**, 12-\*160, 161; 10-\*345, 346
- Jacque, Charles**, 10-65
- Jacquerie**, uprisings, 6-172
- Jade**, precious stone, color plate, 9-frontispiece  
 carving, 12-\*97, 100  
 found in Tien Shan Mountains, 5-437
- Jadwiga** (Hedwig), queen of Poland, 6-447
- Jael**, slaying of Sisera, 5-120
- Jagannath**, temple of, 12-\*103
- Jagiello**, grand duke of Lithuania, 6-447
- Jaguar**, animal, 4-292, †293, 349
- Jahan, Shah**, Mogul emperor, *see* Shah Jehan
- Jainism**, Hindu religion, 5-369
- Jak tree**, fruit, 2-251
- Jakarta**, *see* Batavia
- Jalisco**, state, Mexico, map, 7-596
- "Jalna,"** by Mazo de la Roche, 7-29-1
- Jama Masjid**, mosque, Delhi, 5-\*377
- Jamaica**, island, West Indies, description, 7-54, 54-A, 54-B  
 maps, 7-600, 599  
 native life, 7-\*51, \*53  
 products, 7-55
- James the Conqueror**, king of Aragon, 6-322
- James I**, king of England (VI of Scotland),  
 character and reign, 6-60, 121, 123  
 Authorized version of Bible, *see* Bible  
 Coronation Chair, 12-†182  
 "Counterblast to Tobacco," 9-222  
 crowned, 6-57  
 flag, 14-573  
 Mary, Queen of Scots, his mother, 12-399, 401  
 portrait, 6-\*124  
 relations with Ireland, 6-153  
 relations with Sir Francis Bacon, 13-152  
 treatment of Sir Walter Raleigh, 13-480  
 tries to start silk industry in America, 9-38  
 under-water boats built for, 10-308
- James II**, king of England, reign, 6-72  
 attempts to take charters from New England colonies, 7-126  
 grants religious freedom, 6-128  
 New York named after (when Duke of York), 8-274  
 portrait in infancy, 11-\*225  
 relations with Ireland, 6-155
- James I**, king of Scotland, reign, 6-118  
 Catherine Douglas tries to save, 6-118  
 writes "The King's Quair," 6-118
- James II**, king of Scotland, reign, 6-118
- James III**, king of Scotland, reign, 6-118
- James IV**, king of Scotland, reign: marriage, 6-119
- James V**, king of Scotland, reign, 6-120  
 father of Mary Queen of Scots, 12-398
- James VI**, king of Scotland, *see* James I, king of England
- James Francis Edward Stuart** (the old Pretender), seeks English Crown, 6-75, 130
- James, Henry**, life, 13-336  
 becomes British subject, 13-336, 345  
 use of psychological analysis, 13-346
- James, William**, 13-336
- James Bay**, Canada, map, 7-593
- James, or Dakota River**, river of North and South Dakota, 8-302, 364
- James River**, Va., 8-418  
 mouth, 8-410
- Jameson, Sir Leander Starr**, Transvaal invaded by, 5-487
- Jameson Raid**, 5-487
- Jamestown**, Va., colony, 7-122, 412  
 first church, 7-\*123  
 first glass factory in America, 12-36  
 first settlers, 10-\*15  
 historic tower, 11-\*498  
 John Smith leader of colony, 12-458, 459  
 landing of slaves, 7-\*256  
 part of national monument, 7-414
- Jamin** (Madam Ferdinand Jamin) rose, 2-227
- "Jane Eyre,"** by Charlotte Bronte, 13-247, 248
- Janesville**, Wis., manufacture of farm implements, 8-444
- Janizaries**, Turkish soldiers, 5-411, 412
- Janowski**, chess master, 14-488
- Janssen, Zacharias**, Dutch spectacle maker, makes spying tube, 10-488
- January**, month, origin of name, 10-482
- Janus**, god, 10-482  
 gates of temple opened in time of war, 12-363
- Japan**, country, Asia, description and history,  
 main article, 5-†338-64; general data, 5-364-B  
 • agriculture, 5-\*357, 364-B  
 bamboo, 2-180  
 irrigation, 10-544  
 nature of farms, 7-460, 461  
 ancient name, 13-445  
 animal life  
 birds, 4-212  
 bears, 4-\*317, 318, \*319  
 crabs, 3-\*174, 180, 181, \*183  
 deer, sacred, 4-\*409  
 monkeys, 4-257  
 salamanders, 3-430  
 architecture  
 gateway, 11-\*394  
 pagoda, 11-394, 400  
 area, 5-364-B  
 arms and armor, 10-\*359; 12-\*88  
 art  
 ideas of art and beauty, 5-340, 351  
 influence upon European painters, 11-341  
 baseball, 14-508  
 beauty of: climate, 5-339  
 belief about demon crab, 3-174  
 Christianity, 5-354, 356  
 chronology, 5-346  
 climate 5-336-C, 364-B

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Japan—continued**

- costume, 9-**\*19**; 5-**\*344**
- footwear, 9-**\*54**, **\*56**, **57**
- headdress, 9-**\*88**
- crafts**
  - carving, 12-**\*97**, 100, **\*102**
  - colored metal work, 12-100
  - enameling, 12-64
  - goldsmithery and silversmithery, 12-**\*88**
  - lacquer work, 9-291
  - porcelain, 12-**\*57**
  - pottery, 5-**\*338**
- devotion to parents, 5-349
- diet in, 5-**\*356**, **\*358**
- Diet, meeting place of, 5-**\*364-A**
- drum from, 12-**\*225**
- earthquakes, 1-80
- expansion plans, 10-236
- family life, 5-**†342**, 349
- flag, color plate, 14—following 570, no. 41
- flower arrangement, 9-140
- gardens, 5-339, **\*345**, 351
- geisha girls, 12-**\*333**
- government, 5-364-B
- history**, 5-**†338-64**
  - to 1600, 5-**†338-51**
    - feudal system, 5-347, 357
    - great families; civil wars, 5-348
    - expulsion of foreigners, 5-356, 359
    - early missionaries, 5-354
  - after coming of Europeans**, 5-**†353-64**
    - Perry's visit to; the open door, 5-360
    - modern progress, 12-414
    - western influence, 5-**†361-64**
    - becomes constitutional monarchy, 5-363
    - militarism, 5-364
    - relations with China, 5-333, 335, 336, **\*363**, 364
    - Russo-Japanese peace conference, 7-307
    - relations with Russia, 5-364
    - Russo-Japanese War, 5-364, 6-437
    - activities in Manchuria, 5-336, 364
    - annexation of Korea, 5-364
      - League of Nations, 5-336, 364
      - invades China, 5-364
      - occupies Siam, 5-428
      - occupied by MacArthur, 12-555-J; 5-364-B
  - see also index* World War II, 6-493
- language; writing, 10-**\*37**
- life and customs, 5-**\*338**, 341-48, **\*355-62**
- literature**
  - books of legends and facts, 5-341
  - drama, 5-**\*350**, 351
  - poetry, 5-346, 349; 13-349
- location, 5-364-B
- maps, 5-592, 581
- millers, 9-**\*234**
- observance of New Year's Day, 14-578
- once joined to mainland, 3-61
- Pacific islands owned by, 5-522, 528
- people, 5-364-B, 340

**Japan—continued**

- physical features, 1-76; 5-364-B, 340
- poison sumac in, 9-290
- products and industries, 10-236
  - camphor, 9-219
  - canning, 9-228, 229
  - coal, 10-236
  - cotton industry, 9-29
  - fisheries, 3-85; 9-366
  - pearl fishing, 3-163
  - pottery industry, 12-61
  - rice growing, 9-**†108-11**; 5-**\*357**
  - silk industry, 3-289; 9-37
  - soy bean cultivation, 9-214
  - sponge fishing, 3-85
  - tea growing, 9-135, 136, **\*140**
  - tobacco, 9-223
  - see also agriculture above*
- religions, 5-345, 346
- rising and sinking of coast, 1-70
- smoking outfits, 12-102
- standard of living, 7-462
- tea ceremony and service, 9-**\*134**, 139; 5-**\*360**
- trade, 10-236, 237; 7-575
  - European, 5-354, 356, 357, 360
  - merchant marine, number, 10-232
  - pottery export, 5-**\*338**
- transportation, 10-267
- women rulers, 5-344
- Japan, Sea of, Asia, map**, 6-603
- Japan Current**, 1-**\*223**
- Japanese Alps**, 5-364-B
- Japanese architecture**, *see* Japan, architecture
- Japanese art**, *see* Japan, art
- Japanese black bear**, 4-318
- Japanese glass-rope**, sponge, 3-85
- Japanese ivy**, effect of sunlight on, 2-**\*43**
- Japanese language: writing**, 10-**\*37**
- Japanese literature**, *see* Japan, literature
- Japanning**, lacquer work, 9-291
- Japetus**, moon of Saturn, 1-157
- Jarrow-on-Tyne**, England, monastery, 13-140
- Jarvis, Anna**, originates Mothers' Day, 14-584
- Jasmine**, flower, perfume from, 9-301
  - yellow, South Carolina's state flower, 8-356-A
- Jason and the Golden Fleece**, 14-449, 450
- Jasper National Park**, Alberta, 7-29-V
- Jasper Stone in Aztec temple**, 7-73
- Jasper ware**, china, 12-61
- Java**, island, Malay Archipelago, 5-**†523**, **\*526**
  - see also index* World War II, 6-493
  - map, 5-596
  - medicinal plants, 9-217
  - once joined to mainland, 3-61
  - products and industries, 5-529-B
    - cinnamon, 9-209
    - coffee, 9-130
    - quinine and cocaine, 9-217
    - rice growing, 9-**\*110**
    - rubber, 9-**\*263**, **\*265**
    - Sisal, 9-285
    - sugar, 9-116

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Java**, products and industries—*continued*  
tea, 9-135

weaver birds, 4-182

"Java," frigate, fight with "Constitution," 7-  
\*210

**Java and Madura**, division of Dutch East Indies,  
5-529-B

**Java man**, prehistoric man, 5-\*25, \*30

**Java Sea**, Pacific Ocean, map, 5-596

**Java Sparrows**, 4-182

**Javanese**, people, 5-523

**Javelin throwing**, 14-\*475

**Javelin vampire bat**, 4-\*274

**Jaws**

effect of sucking fingers upon, 2-312

color plate, 2-\*278

**Jay, John**, negotiates treaty between England  
and U. S., 7-197

**Jay**, bird, 4-†226

color plate, 4-\*88

English variety, 4-174

**Jayhawker State**, 8-132

**Jayhawkers**, people of Kansas, 8-132

**Jay's Treaty**, 7-197, 198

"Jealous Husband, The," painting, 11-\*260

**Jeanne d' Arc**, *see* Joan of Arc

**Jeans**, Sir James Hopwood

atmospheric calculations, 1-372

theory of sun's heat, 1-386

tidal theory of solar system, 1-7

**Jeep**, army, 6-\*537; 7-\*478

**Jeffers**, Robinson, poet, 13-353

**Jefferson**, Thomas, president of the U. S., biog-  
raphy, main article, 12-†503-6, 456-1)

administration, 7-203-10; 12-505

buildings designed by, 11-508; 8-407

carving on Mount Rushmore, 8-\*361

Declaration of Independence written by, 7-  
166; 12-504; 14-585

Democratic party founded, 7-193, 371

election, 7-200

Embargo Act, 7-208

epitaph, 12-506

feeling for Roman architecture, 11-511

home at "Monticello," 11-\*514

ideas conflict with Hamilton, 12-505, 510;  
7-193

in France, 12-504

influence upon Virginia Constitution, 12-504

Lewis and Clark expedition sent out by, 13-492

Louisiana Purchase, 13-491; 7-206

method of traveling, 10-146

omen in death of, 7-223

political leadership, 7-†193-200

political party headed by, 12-478

portrait, 7-\*193

by Thomas Sully, 12-\*504

quoted, 7-361; 12-468

vice-presidency, 12-456-G

**Jefferson, Fort**, national monument, Florida,  
8-76-A

**Jefferson, Mount**, Oregon, 8-325

**Jefferson City**, Mo., 8-207

State Capitol, 8-\*207

**Jefferson county**, Ohio, coal mining, 8-311

**Jefferson River**, Montana, 8-220

**Jehan, Shah**, Mogul emperor, *see* Shah Jehan

**Jehangir**, Mogul emperor, 5-375

**Jehoshaphat**, king of Judah, 5-124

**Jehovah**, god of the Hebrews, 5-273

**Jehu**, king of Israel, upheld by Elisha, 5-126

**Jellachich, Joseph**, Count, 6-286

**Jellinge**, Denmark, memorial stone, 6-409

**Jellyfish**, main article, 3-†104-14

alternation of generations, 3-109

color, 3-107

life cycle, 3-106

luminescence, 3-†107, 111, 114

varieties, 3-111, 113

**Jelutong**, source of; use in chewing gum, 9-292

**Jena, Battle of**, 6-197; 12-430

**Jenghis Kahn**, *see* Genghis Kahn

**Jenkin's Ear**, War of, 13-190

**Jenner, Edward**, life; discovery of vaccination,  
main article, 13-†365-67

**Jennewein, Paul**, pottery by, 12-60

**Jenney, William Le Baron**, 11-518

"Jennie Gerhardt," by Theodore Dreiser, 13-347

**Jensen, Georg**, artistry in metal work, 12-92

**Jensen, Nicholas**, 10-51

**Jephthah**, chieftain of Israel, and his daughter,  
5-\*121

**Jerboas**, rodents, 4-†380

**Jeremiah**, Hebrew prophet, 5-126

**Jericho**, biblical city

Jews before the walls of, 5-\*120<sup>m</sup>

trumpets that signaled fall of, 12-\*204, 205

• **Jerked meat**, 9-326

**Jeroboam**, king of ancient Jews, 5-124

**Jérôme**, king of Westphalia, *see* Bonaparte,  
Jérôme

**Jerome, St.**, 7-331

**Jerome, Jennie**, *see* Churchill, Lady Randolph

**Jerome, Leonard**, 12-449-A

"Jersey," meaning of word, 8-252-A

**Jersey**, island; English Channel, 6-488

map, 6-578

New Jersey named after, 8-252-A

**Jersey black giant**, breed of chicken, 9-\*350

**Jersey Blue State**, 8-252-A

**Jersey Blues**, 8-252-A

**Jersey cattle**, 9-†331 fol.; 6-†488

**Jersey City**, N. J., 8-248

formerly Paulus Hook, 8-250

**Jerusalem**, Palestine

before capture by Nebuchadnezzar, 5-\*134

capture of, celebrated in Arch of Titus, 11-  
64, \*68

destruction by Nebuchadnezzar, 5-96

destruction by Romans, 5-133, 238

in Middle Ages; crusades to, 5-135, 280-83,  
409; 6-\*167; 12-\*137

victories of the Christians over, 5-283, 299

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Jerusalem, in Middle Ages--continued**

victories of Turks, 5-270, 281

victories of Saladin, 5-283

Jews burned by crusaders, 5-135

Jews forbidden to enter, 5-269

made capital of Israel, 5-123

nations that have struggled for, 5-\*141

Pompey's entry and siege, 5-129, 222

rebuilding of, 5-\*129

temple, 5-123, \*125

defiled by Greeks and Romans, 5-129

Wailing Wall, 5-131

**"Jerusalem Delivered,"** by Tasso, 13-68

tapestry illustrating, 6-\*167

**Jespersen, Otto, 10-6****Jester of France** (Rabelais), 13-105**Jesuits** (Society of Jesus Christ)

fort on Mt. Desert Island, 8-151

founded by Loyola, 13-545

Italy, 6-302

missionaries to Indians, 7-137; 13-483

Portugal, 6-341

Spain, 6-327, 332, 334

turned out of South America, 5-499

**Jesus Christ**

brought before Pilate, 5-†132

crucifixion of, a tragic error of Jews, 5-132

fish the symbol for, 11-74

Golden Rule, 8-333

language spoken by, 5-89

meeting with St. Peter on road from Rome, 10-150

Mohammedans regard as prophet, 5-422, 13-522

played by Anton Lang in Passion Play, 12-\*328

reproaching leaders of history, painting, 5-\*269

taken to temple for baptism, 5-125

time counted from birth of, 10-476

year of birth incorrectly fixed, 10-476

*see also* Jesus Christ in art**Jesus Christ in art****"Agony in the Garden,"** Mantegna's and

Bellini's conceptions compared, 11-175

as the Good Shepherd, 11-†74

**"Christ of the Andes,"** sculpture, 5-†510

entombment, sculpture, 11-\*93

Flemish school, 11-\*197, \*199

German, 11-\*207

Gothic, 11-\*93, \*96, †98

sculpture, Chartres Cathedral, 11-\*96

Italian, 11-\*133, \*142, \*149, \*153, \*161, \*183, \*184

scenes depicting the betraying kiss

Giotto, 11-\*113

school of Cimabue, 11-\*112

**"The Light of the World,"** by Holman Hunt, 11-\*316, 320**Jet propulsion, main article, 10-†328-S-328-U**

planes, 7-488-A, \*480; 10-\*368 C, \*368-D

ram jet, 10-365

**Jet, source and uses, 9-445****"Jew of Malta,"** by Christopher Marlowe, 13-163**Jewel boxes, 12-52, \*117****Jewel Cave, S. D., 7-417****Jewelers**

Arabian, 12-\*92

distinction between goldsmiths and, 12-80

expert knowledge needed, 12-126

place of honor once held by, 12-125

**Jewelry, main article, 12-†117-26**

Arabian, 7-396

Byzantine, 12-†124-25

church decoration and ornament, 12-124, 125

earrings indication of rank, 5-440

Egyptian, 12-79, 80, \*117, \*119, 120; 11-\*15

enamel, 12-†64, \*65

Etruscan, 5-\*192, †193; 12-\*117, †121-22

filigree work, 12-†122

flowers in jewelry of Ur, 12-117, 120

glass, 12-27 fol; †124

Greek, 12-103, †122, \*123; 11-\*45

imitation, 12-126

iron, 12-6

Israelites, 12-79

machine made, 12-126

medieval, 12-124

modern, 12-126

mosaic, 12-110

pottery, 12-54

oriental, 12-120, \*125

Renaissance, 12-125

Rhode Island industry, 8-346

Roman, 12-†82, 105, 122, †124; 9-12

Romanesque style, 12-125

use of, in ancient costume, 9-12

*see also* Gems**Jewels****gems, 9-†428-33**

color plate, 9-frontispiece

in watches, 10-468

source of, 3-97

*see also* Gems; Jewelry**"Jewels of the Madonna,"** by Wolff-Ferrari, 12-258-D**Jewfish, 3-\*73****Jewish calendar, 10-476****"Jewish Rabbi,"** painting by Rembrandt, 11-277**"Jewish State, The,"** by Theodore Herzl, 5-138**Jews, people, main article, 5-†116-41**

a nation of thinkers, 5-118

anti-Semitism, 5-138

breads made by, 9-240

costume, ancient, 9-\*12

hats, 9-92

dawn of liberty, 5-138

earliest heroes, 5-120

forcible conversion, 5-137

ghetto system; badge of shame, 5-135, 138

**"Golden Age,"** in Spain, 5-134**history, Biblical, 5-†117-29**

Assyrian rule, 5-126-29

capture by Nebuchadnezzar, 5-96

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Jews, history, Biblical**—*continued*  
 conquest by Rome, 5-129, 132  
 first kings of Israel, 5-123  
 Great Exile; Babylonian captivity, 5-127  
 in Egypt, 5-68, \*69, 119  
 in Palestine, 5-†118-29  
 separation of Israel and Judah, 5-124  
 war with Philistines, 5-122  
**history, after the time of Christ**, 5-†131-41  
 banished from Portugal, 6-341  
 dispersion, 5-133, 238, 269  
 driven from Zion, 5-\*135  
 in Africa, 5-451  
 in Arabia, 13-522  
 in Europe, 5-†135-41  
 in Russia, 6-437; 12-311  
 in Spain, 5-134, 136  
 Israel established, 6-556, †563; 5-†138-41  
 Palestine problem, 5-141  
 persecution, 5-132, 133, 134, 141  
   in Germany, 6-240-41, 495, 497  
 revolt against Rome, 5-133, 238  
 siege of Jerusalem, 5-133  
 Spanish Inquisition, 6-323  
 toleration of Joseph II in Austria, 6-264  
 influence of Greek culture upon, 5-129  
 intellectual leaders, 5-134  
 Judaism, 5-138  
 modern types and customs, 5-\*139-40  
 money lenders' fate, 5-135  
 peacocks kept by ancient Hebrews, 4-191  
 ace, 5-43; 13-522  
 refuge in Dominican Republic, 5-141  
 religion, 5-119, 125, 131, 133, 273  
   a product of Semites, 5-44  
   Ark of the Covenant, 5-122, †123  
   bigoted rules, 5-137  
   crucifixion of Christ a tragic error, 5-132  
   distinction between Sephardim and Ash-  
   kenazim, 5-137  
   false Messiahs, 5-138  
   Law of Moses, 5-119 fol., 133, 137, 138  
   Mohammedan attitude toward, 5-134, 396,  
   422; 13-522, 523  
   prophets, 5-125, 126  
   Talmud, 5-133  
   tolerated in Rome, 5-273  
 school at Jabneh; other centers of learning,  
 5-133  
 two main groups, 5-137  
 why a single people, 5-131  
 Zionist movement, 5-138, 141  
*see also* Hebrews  
**Jezebel**, wife of Ahab, king of Israel, 5-124  
 and the prophet Elijah, 5-125  
**Jib**, sail, 10-\*171  
**Jidda**, Arabia  
 Mohammedan life in, 5-417-19, 421  
 port of Mecca pilgrims, 5-416  
 waterworks, 5-418  
 why surrounded by walls, 5-421  
**Jigger**, conveyance, 10-130

**Jimmu Tenno**, legendary Japanese emperor,  
 5-340  
**Jimson weed**, fruit, 2-\*204  
**Jimson Weed**, painting, 11-\*392-B  
**Jingo**, legendary Japanese empress, 5-344  
**Jinnah, Mohammed Ali**, biography, 6-566  
**Jinricksha**, 10-\*145; 5-\*348  
**Jo**, heroine of "Little Women," 13-321  
**Joachim, St.**, Giotto's paintings of, 11-\*115, 118  
**Joachim, Joseph**, and Brahms, 12-302  
**Joan of Arc, life**, main article, 12-†385-90  
   Anatole France's life of, 13-137  
   capture by English, painting, 10-\*356  
   in Hundred Years' War, 12-†386 fol.; 6-175  
   voices and visions, 12-†385-87, 390; 6-\*172  
 "Joan of Arc," by Mark Twain, 13-330  
**Joanna**, child bride of David II of Scotland,  
 6-\*115  
**Joanna the Mad**, wife of Philip I, king of Cas-  
 tile, 6-\*326  
**Job**, Book of, Blake's engravings, 13-212  
**Jocasta and Oedipus**, in mythology, 14-444  
**Jockey Hollow**, historical memorial, N. J., 7-412  
**Joeys**, young kangaroos, 4-†461  
**Joffre, Joseph Jacques Césaire**, 6-201  
**Johanan ben Zakkai**, Jewish rabbi, 5-133  
**Johannesburg**, Transvaal  
   capture by British, 5-488  
   gold discovered, 5-486, \*488  
   wanderers' cricket ground, 5-\*491-A  
**Johannson H.**, electron-formed images, 10-489  
**Johansen**, Arctic explorer, 13-499  
**John, Saint**, apostle  
   painting by Dürer, 11-\*210, 211  
   "St John's Vision of Paradise," painting by  
   Hubert van Eyck, 11-194  
   statue, 9-\*7  
   by Ghiberti, 11-128  
   symbol, 11-77  
**John, XII**, pope, and Otto I, 5-295; 6-295  
**John**, king of Castile, Roger van der Weyden's  
   service to, 11-200  
**John**, king of England, character and reign, 6-23  
   and Richard the Lion-hearted, 12-372, 373  
   defeated in France, 6-169  
   government of Ireland, 6-149  
   Magna Charta granted by, 6-\*18, 24, 170;  
   7-\*352, 353  
   treatment of Jews, 5-135  
**John II, the Good**, king of France, 6-172  
**John II, Casimir**, king of Poland, 6-450  
**John III, Sobieski**, king of Poland, reign, 6-450  
   delivers Vienna from Turks, 6-\*262, 264  
**John I**, king of Portugal, 6-340  
**John II**, king of Portugal, names Cape of Good  
   Hope, 5-476  
**John VI**, king of Portugal  
   moves court to Brazil, 5-507, 508  
**John III**, king of Sweden, 6-400  
**John**, duke of Berry, patron of art, 11-105  
   book collection and art from, 11-\*104, 105,  
   †191-93

The asterisk (\*) refers to picture and its explanation only The obelisk (†) refers to illustrated text.

- "John Brown's Body,"** poem by Benét, 13-354  
**"John Bull,"** locomotive, 10-\*191  
**John Bull,** name for Englishmen, 13-184  
**John Crerar Library,** Chicago, Ill., 10-561  
**John Daniel,** famous gorilla, 4-†244  
**John Day River,** Oregon, 8-331  
**"John Gilpin,"** by Cowper, 13-213  
**"John Keats,"** by Amy Lowell, 13-349  
**John o' Birds (John Burroughs),** 13-425  
**John of Austria, Don,** 6-327  
**John of Bologna,** *see* Bologna, Giovanni da  
**John of Gaunt,** duke of Lancaster, friend of Chaucer, 13-143  
**John of Marville,** tomb of Duke of Burgundy 11-105  
**John the Baptist, Saint**  
     painting by Ghirlandaio, 11-\*144, 145  
     painting by Memling, 11-\*196  
     portrait by Leonardo da Vinci, 11-\*152  
**Johns Hopkins University,** Baltimore, Md., 8-162  
**Johnson, Amy,** aviatrix, portrait, 10-\*327  
**Johnson, Andrew,** president of the U. S., 12-456-D  
     administration, 7-267-71  
     house at Greenville, 7-\*268  
     impeachment, 7-271  
     vice-presidency, 12-456-G  
**Johnson, Benjamin F., of Boone (James Whitcomb Riley),** 13-338  
**Johnson, Eastman,** painting, 11-\*369  
**Johnson, Eliza McCordle (Mrs. Andrew Johnson),** 12-563  
**Johnson, Esther,** the "Stella" of Swift, 13-178  
**Johnson, Richard M.,** vice president of the United States, 12-456-G  
**Johnson, Samuel, life and works,** main article, 13-†192-95  
     aid to Goldsmith, 13-\*198, 199  
     associates and Literary Club, 13-†192 fol., 201, 206  
     Boswell's devotion and biography, 13-196  
     Dictionary, 13-195; 10-\*22  
     opinion of Richardson's novels, 13-187  
     patronage of Lord Chesterfield sought and denied, 13-\*194  
     portrait by Reynolds, 13-†195; 10-\*22; 11-298  
**Johnson, William Samuel,** at Constitutional Convention, 12-\*496  
**Johnson grass,** 9-314  
**Johnston, Albert Sidney,** defeat at Shiloh, 7-260  
**Johnston, Archibald,** music by, 8-106-A  
**Johnston, Sarah Bush (Mrs. Thomas Lincoln),** 12-528  
**Johnston, William M.,** tennis strokes, 14-†468-69  
**Johnston, island,** No. Pacific Ocean, 8-466  
**Johnstone, Commodore,** move on Cape Colony, 5-479  
**Johnstone, Sir Harry,** discovers okapi in African forests, 4-405  
**Johore,** one of nine native states in the federation known as Malaya, 5-430-B  
**Joints, anatomy**  
     number, 2-323  
     structure, 2-\*320, 321, 323, \*331  
     variety of movement, 2-324  
**Joints, cabinetmaker's, how to make,** 14-†27  
**Joinville, Jean de,** chronicler of St. Louis, 12-378  
**Jokesmith's game,** 14-151  
**Joliet, Louis, life and explorations,** main article, 13-187, 483  
     Arkansas visited, 8-28  
     companion of Father Marquette, 7-137  
     Illinois, 8-96  
     Iowa, 8-119  
**Joliet, Ill.**  
     Indian mounds, 8-96  
     industries, 8-104  
**Joliot, Irene,** portrait, 1-\*284  
**Jolly Old Miller, game,** 14-171  
**Jonathan, son of Saul,** friendship with David, 5-123  
**"Jonathan Wild the Great,"** by Fielding, 13-188  
**Jones, Griffith,** Welsh schools established by 6-141  
**Jones, Humphrey W.,** song by, 8-132  
**Jones, Inigo,** 11-491, 502  
     furniture designs influenced by, 12-188  
     portrait, 11-\*493  
**Jones, John Paul, life; naval victories,** main article, 12-†500-2  
     and colonial naval force, 7-482, 483  
     buried in chapel of Naval Academy, 7-488-D  
     Cooper's "The Pilot," a story about, 13-297  
     in battle between "Bonhomme Richard" and "Serapis," 7-492, 493; 12-502  
     in Russian navy, 12-502  
     plunders British ships, 12-501  
     portrait, 12-\*502  
**Jones, Robert Edmond,** director of Central City Play Festival, 8-52-A  
**Jones, Robert T. (Bobby),** 14-\*494, 495  
**Jonson, Ben, life and works,** main article, 13-†163-64  
     emphasis on form in drama, 12-330  
     portrait, 13-\*163  
**Jordan, country, Western Asia,** 5-336-D  
**Jordan paper-making machines,** 9-\*278  
**Jordan River, Palestine, length,** 10-253  
**Jordan River, Utah,** 8-396  
**"Jorinda and Jorindel,"** fairy tale, text, 14-†234-35  
**Jornada del Muerto, spring,** 8-256  
**"Jo's Boys,"** by Louisa May Alcott, 13-321  
**Joseph, Saint, husband of Mary,** 5-125  
**"Joseph and His Brothers,"** by Mann, 13-289  
**"Joseph Andrews,"** by Fielding, 13-187, 188  
**Joseph I, Holy Roman emperor,** 6-264, 284  
     and throne of Bavaria, 6-223  
     Edict of Toleration, 5-138  
**Joseph of Arimathea**  
     and Holy Grail, 14-393, 398  
     apostle to Britain, 6-\*7

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Josephine**, Empress of the French  
 birthplace, 7-64  
 divorced by Napoleon, 12-428  
 portraits, 11-\*286, \*287; 12-\*428
- Joshua**, Jewish leader, 5-120
- Joshua tree**, 2-\*ix
- Joshua Tree National Monument**, California, 8-42-B
- Josiah**, king of Judah, 5-126
- Jostedalsbrae**, ice field, 6-407-A
- Joubert**, Petrus Jacobus, Boer leader, 5-487
- "Journal to Stella,"** by Swift, 13-178
- Journalism**  
 Defoe father of, 13-176  
 "Spectator" and "Tatler" brilliant examples of, 13-181
- "Journey to the Harz, A,"** by Heinrich Heine, 13-286
- Journeymen**, in medieval guilds, 5-310
- Jousts**, medieval, 10-†354  
 boot worn in, 9-\*54
- "Joyous Fountain,"** Siena, sculpture, 11-120
- Joyous Gard**, Lancelot's castle, 14-400
- Juan de Fuca**, Strait of, 8-428
- Juana**, early name for Cuba, 7-56
- Juarez, Benito**, president of Mexico, 7-84, 86
- Judah**, history, 5-124-29; *see also* Jews
- Judah, Rabbi**, 5-133
- Judah, Theodore P.**, 10-192
- Judaism**, religion of Jews, *see* Jews, religion
- Judges**, how chosen; duties, 7-358
- juvenile court**, 7-442  
 state, 7-386; *see also* subhead political facts under each state  
 United States courts, 7-366
- Judicial functions of government**, 7-357, 358
- Judith River**, Montana, 8-220
- Juet**, keeps log of Hudson's voyage, 13-477
- Jugoslavia**, *see* Yugoslavia
- Jugular vein**, 2-\*335  
 flow of blood through, 2-376
- Jugurtha**, Numidian king, 5-219
- Jujube**, tropical fruit, 9-196
- Julia**, basilica, Rome, 5-\*231
- Julian calendar**, 10-482
- Julian emperors of Rome**, 5-226, 231-37
- Julian "the Traitor"** brings Moors into Spain, 6-320
- Julius Caesar**, *see* Caesar, Caius Julius
- "Julius Caesar,"** by Shakespeare, 13-158  
 quotations from, 12-358, 359
- Julius II**, pope, patron of Michelangelo  
 commissions Raphael to paint Vatican frescoes, 11-167  
 Michelangelo's carvings for tomb of, 11-\*155, 162  
 portrait, 11-\*168  
 shown in painting of Michelangelo's workshop, 12-\*95
- Julius III**, pope, and Palestrina, 12-260
- Julus**, a millepede, nest building, 3-267
- July**, month, named for Julius Caesar, 10-482; 12-356
- July fourteenth (Bastille Day)**, French holiday, 6-187
- Jumbo State**, 8-386-A
- Jumel Mansion**, New York, 7-154
- Jumna River**, India, 5-\*370; 10-263
- Jumper**, Dutch, how to make, 14-†33
- Jumping**, sport, 14-476
- Jumping beans**, Mexican, 2-257
- Jumping kangaroos**, 4-†460
- Jumping mice**, 4-380
- Jumping shrew**, 4-\*278, 282
- Jumping spider**, 3-\*407, 411
- Junco** (snowbird), 4-126, 128, \*129
- June**, month, origin of name, 10-482
- June bug**, 3-\*330, 338, \*339
- Juneau**, Alaska, 8-16  
 gold mines, 8-13  
 temperature, 8-16-A
- Jungfrau**, mountain peak of Alps, height, 6-162-C
- "Jungle, The,"** by Upton Sinclair, 13-347
- "Jungle Book,"** by Rudyard Kipling, 4-330; 13-269
- Jungles**, 2-196; 3-27  
 products from Amazon jungles, 5-518-B
- Juniata River**, Penn., 8-341, \*339
- Juniper**, tree  
 berries, 2-99  
 trimmed in shape of dog, 2-\*255
- Junipero, Serra, Miguel José**, Franciscan missionary, 8-36  
 at San Diego, 7-\*230
- Junk**, Chinese ship, 5-\*327; 10-†161, \*165
- Junkers**, Prussian nobles, Germans ruled by, 6-235
- Juno** (Hera), goddess, 14-408  
 aids Haleyone, 14-454  
 and Hercules, 14-426-30  
 month of June named after, 10-482  
 vengeance on Aeneas, 14-433
- Juntas**, formed against King Joseph of Spain, 5-504
- Jupiter (Zeus)**, god, 14-407, 1-154  
 altar of Zeus at Pergamon, 11-56, \*416  
 and Semele, 14-411  
 and Vulcan, 1-75  
 avenges the gift of fire to man, 14-422; 13-33  
 causes flood, 14-436  
 Endymion punished by, 14-456  
 festival in honor of, 14-\*408  
 grants immortality to Eithonus, 14-442  
 Minerva springs from brain of, 14-\*406, 409  
 Prometheus punished by, 14-421  
 statues, 11-41  
 Phidias' statue, 5-167, 185, \*186; 12-64  
 temple of, at Olympia, 5-\*167  
 visit to Philemon and Baucis, 14-451
- Jupiter**, planet, 1-154; table, 1-106  
 place in solar system, color plate, 1-98; table, 1-106  
 relative size, 1-\*16

The asterisk (\*) refers to picture and its explanation only The obelisk (†) refers to illustrated text.



- Jura Mts.**, 6-241-B  
**Jurassic period**, 3-37, 40  
   forms of life in, table, 3-64  
   table diagram showing rock formation, 1-†40  
**Jury, trial by**, 7-385  
   hearing case, 7-\*385  
   in Athens, 5-167; 7-†347  
   introduced into England, 6-†21  
**"Just Imagine,"** photoplay, setting designed for, 10-\*511  
**"Just-So Stories,"** by Kipling, 13-269  
**Justice**, Aristotle's rules, 13-10  
**Justice, Department of**, U. S., 7-378  
**Justices, state**, *see subhead* political facts *under each state*  
**Justices of the United States Supreme Court**, 1-†336-37  
**Justin of Nassau**, in painting by Velasquez, 11-254  
**Justinian I** (Flavius Anicius Justinianus), Byzantine emperor, 5-405  
   builds churches and palaces, 11-81  
   introduces silk industry into Europe, 9-37  
   St. Sophia built by, 11-446  
   treatment of Belisarius, 5-407  
**Justinian Code**, 5-405  
**Jute**, preparation and uses, 9-\*285, 310  
   in rope making, 9-287  
   in rugs, 12-159  
**Jutes**, Germanic people, 5-264, 269, 271, 292  
   settle in England, 6-\*5, 9  
**Jutland peninsula**, forming greater part of Denmark, 6-416-B  
   map, 6-597, 598  
   taken by Sweden, 6-402  
**Juvenal**, Roman writer, 5-242  
**Juvenile court**, 7-442

# K

- K rations**, in World War II, 9-214-A  
**K<sub>2</sub>**, mountain of Himalayas, 5-336-B  
**Ka**, spirit of man, Egyptian belief, 5-54  
**Kaaba**, shrine in Mosque, Mecca, 5-421, 422  
   sacred stone in, 5-421  
   given to another shrine, 5-398  
   rededicated by Mohammed, 13-523  
**Kabalo**, Belgian Congo, dancer, 12-\*329  
**Kabul**, capital of Afghanistan, 5-†433, 435  
**Kadesh**, Syria, battle won by Ramses II, 5-68  
**Kadiak bear**, 4-\*316  
**Kadiak Island**, *see* Kodiak  
**Kadija**, wife of Mohammed, 13-522  
**Kaffirs**, African Negroes  
   attack Dutch colonists, 5-478  
   race, 5-445  
   territory of, desolated, 5-484  
   warfare, 5-481  
**Kafir corn**, 9-120  
**Kagu**, bird, 4-\*103  
**Kahoolawe**, or Kahulani, island of Hawaiian group, 8-461  
   map, 8-562  
**Kaieie Waho Channel**, Hawaiian Islands, map, 8-562  
**Kainite**, a mineral salt, used as fertilizer, 7-455  
**Kaiserburg**, Nuremberg, 5-\*309  
**Kaisers**, German rulers, 5-295  
**Kaiwi Channel**, Hawaiian Islands, map, 8-562  
**Kalahari, Desert of**, Africa, rainfall, 5-473-A  
**Kalamazoo River**, Michigan, 8-186-A  
**Kaldi**, *see* Chaldeans  
**Kale**, vegetable, 9-148  
**Kalmar Castle**, Sweden, 6-\*395  
**Kalmar Union of Scandinavian countries**, 6-386, 396, 411, 412  
**Kalmia latifolia**, flower, 8-62  
**Kama River**, Russia, from Vyatka province to Volga, in Volga project  
   map, 6-600  
**Kamakura**, Japan, statue of Buddha, 13-\*518  
**Kamchatka**, peninsula, Russia, maps, 6-603; 13-502-A  
**Kamehameha I**, Hawaiian king, 8-458  
**Kaministikina River**, Canada, 10-\*268  
**Kamukahi Channel**, Hawaiian Islands, map, 8-562  
**"Kan Jin Cho,"** Japanese drama, 5-350  
**Kanawha rivers**, Great and Little, West Virginia, 8-436-A  
**Kane, Elisha**, Arctic trips, 13-498  
**K'ang Hsi**, Chinese emperor, 5-330, 331  
**Kangaroo**, animal, 4-†460-62, \*459, \*474; 5-544  
   drawing and mounting, 14-\*66  
   early reports of, 5-544  
**"Kangaroo,"** bicycle, 10-\*142  
**Kangaroo rat**, 4-380, \*382, \*385  
   kin to prehistoric animals, 3-44  
**Kankakee River**, U. S., 8-116  
   helps form the Illinois, 8-106  
**Kansas**, state, U. S., **description and history**, main article, 8-†126-30; general data, 8-131-132-A  
   agriculture, 8-129  
   corn picking and husking machine, 8-\*128  
   American Dust Bowl, 7-466  
   area, 8-131  
   capital and capitol building, 8-\*126  
   charities and correction, list, 8-131  
   cities, towns, list, 8-130, 132  
   climate, 8-131  
   counties, list, 8-132  
   education, 8-130  
   institutions of higher learning, list, 8-131

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

**Kansas, state, U. S.—continued**

flag, 8-132  
 fossils found in, 3-43  
 history, 8-127-29  
   Civil War, 8-129  
 holidays, 8-132  
 Indians, 8-127  
   reservations, 8-132  
 industries, *see below* products and industries  
 interesting facts, 8-132  
 Lecompton Constitution, 12-456-B  
 location, 8-131  
 map, 8-196  
   on United States map, 7-594  
 motto, 8-132  
 name, 8-132  
 nicknames, 8-132  
 physical features, 8-131, 127  
 political facts, 8-131  
 products and industries, 8-†129-30  
   coal, 9-442  
 slavery question, 8-128  
 squatter sovereignty, 7-248  
 state bird, 8-132  
 state flower, 8-132  
 state song, 8-132  
 struggle over slavery, 12-534  
 tornadoes, 1-\*229  
 transportation, 8-130  
 "Kansas," meaning, 8-132  
 "Kansas," song, 8-132  
 Kansas, University of, 8-\*127  
 Kansas City, Kansas, industries, 8-130  
 Kansas City, Mo., industries, 8-212  
 Kansas Indians, 8-132  
   Oklahoma land grant, 8-317  
 Kansas-Nebraska Bill, 12-456-E, 534; 7-248  
 Kansas River, U. S., 8-131  
   state named after, 8-132  
 Kansas State College, 8-127  
 Kant, Immanuel, life and works, main article, 13-†21-22  
   portrait, 13-\*21  
   quoted, 1-180  
 Kaolin, china clay, 12-43  
   deposits in Europe, 12-60, 61  
 Kapok, milkweed pods substitute for, 2-3  
 Kara Sea, Arctic Ocean, maps, 13-502-A; 5-573  
 Karachi, India, export goods, 10-237  
 Karafuto, *see* Sakhalin  
 Karka (barking deer), 4-413  
 Karnak, Temple of, 11-\*411, †412; 5-\*66, 68, 69  
   pylons, 5-\*66; 11-\*412  
 Karo, Joseph, rules for Jewish practice, 5-137  
 Karolyi, Julius, Count, 6-290  
 Karoo, or Karroo, Great, region of Africa, 5-473-A  
 Kashgar, oasis city, Turkestan, 5-436  
 Kashgaria (Eastern Turkestan), Asia, 5-436  
 Kaskaskia, River, Ill., 8-106

Kasserine Pass, North Africa, 6-540  
 Kassites, ancient people, 5-88  
   bring horse into civilization, 5-87  
 Kat, Egyptian weight, 10-371  
 Katabolism, in cells, 2-361  
 Katahdin, Mount, Maine, 8-156  
   state park, 8-155  
 Kathiawar, peninsula, India, people of, 5-\*371  
 Katipunan, Philippine secret society, 8-568  
 Katmai, Mount, Alaska, 8-16, 16-A  
 Katmai National Monument, Alaska, 7-416; 8-16-A  
 Katmandu, capital of Nepal, 5-441  
 Kattegat (Cattegat), arm of North Sea, maps, 6-597, 598  
 Katydids, insects, 3-345, 349, \*350  
   reason for color, 4-478  
 Kauai, island of Hawaiian group, 8-461  
   map, 8-562  
 Kaufman, George, playwright, 13-355  
 Kaunas, Lithuania, *see* Kovno  
 Kauri, New Zealand tree, 5-\*537  
 Kauri gum, 5-541  
 Kawaguchi Lake, Japan, 5-\*364-A  
 Kay, Sir, in Arthurian romances, 14-379, 388  
 Kay, John, devises fly shuttle, 10-344  
 Kayak, skin boat, 6-†484; 10-138, †139  
 Kazak Soviet Socialist Republic, 6-443-B  
 Kean, Edmund, English actor, 12-332  
 Kearney, Lawrence, and open door policy in China, 7-488  
 Kearney, Nebraska, industries, 8-226  
 Kearney, N. J., 8-248  
 Kearny, Stephen Watts, American officer, taking of Santa Fe, 8-254  
 Keats, John, life and works, main article, 13-†230-32  
   and contemporaries, 6-86  
   portrait, 13-\*232  
   Shelley's poem on the death of, 13-229  
 Kedah, state of Non-Federated Malay States, British Malaya, 5-430-B  
 Keel, section of pea flower, 2-166  
 Keeling Islands, *see* Cocos Islands  
 Keep (donjon), of castle, 11-457  
 Keeper, of magnet, 1-\*487, 488  
 Keepers of the Eastern Door, 8-269  
 Keepers of the House, 8-269  
 Keepers of the Western Door, 8-269  
 Keewatin, prov., dist., Canada, map, 7-592  
 Keewatin Center, of ice sheet, 1-†61  
 Keiki, Japanese shogun, 5-362  
 Keimer, employer of Benjamin Franklin, 12-464  
 Keistutis, Lithuanian duke, 6-\*461  
 Kelak, raft, 5-\*94  
 Kelantan, one of nine native states in the federation known as Malaya, 5-430-B  
 Kelim, oriental rug, 12-152  
 Keller, Helen, biography, main article, 12-†567-68  
   portrait, 12-\*567  
 Kellogg, Idaho, silver mine, 8-\*90

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Kellogg-Briand Pact** for renunciation of war, 7-338  
     signed by England, 6-106  
     signed by Russia, 6-442
- Kells, Book of**, 11-84
- Kelly, George**, dramatist, 13-354
- Kelmscott Press**, 10-66
- Kelps**, water plants, 2-\*66, 69
- Kelvin, William Thomson**, first baron, life and work, main article, 13-†390-92  
     cable enterprise aided by, 10-102, 106  
     compass invented by, 13-392  
     jubilee, 13-391  
     opinion of Bell's telephone, 10-112  
     portrait, 13-\*391
- Kemble, Charles**, buys von Weber's "Oberon," 12-282
- Kenesaw**, *see* **Kennesaw**
- "Kenilworth,"** by Sir Walter Scott, 13-222
- "Kenilworth,"** cantata by Arthur Sullivan, 12-320
- Kenilworth Castle**, Caesar's Tower, 11-\*457
- Kennebec River**, Maine, 8-156  
     ancient graves along banks, 8-149  
     colony at mouth, 8-151
- Kennel**, for dog, how to make, 14-†42
- Kennelly-Heaviside Layer**, 10-121-11-21-1
- Kennesaw Mountain site**, 7-413
- Kennesaw Mountain National Monument**, 8-84
- Kenosha**, Wisconsin, manufactures, 8-444
- Kent, Rockwell**, painting by, 11-\*371
- Kent Island**, Maryland, 8-159
- Kentucky**, state, U. S., description and history, main article, 8-†133-38; general data, 8-138-A-138-B  
     agriculture, 8-136, 137  
     animal life, 4-274  
     area, 8-138-A  
     capital and capitol building, 8-\*133  
     charities and correction, 8-138-A  
     cities, towns, list, 8-138, 138-B  
     climate, 8-138-A  
     counties, list, 8-138-B  
     Daniel Boone and early settlements, 12-470 fol.  
     depicted in E. M. Roberts' writings, 13-352  
     doctrine of nullification, 7-200  
     education, 8-138  
         educational institutions, list, 8-138-A  
     flag, 8-138-B  
     historical park, 7-414  
     history, 8-135-37  
         admitted to Union, 8-136  
         Civil War, 8-137  
         first settlement at Fort Harrod, 7-\*138  
     holidays, 8-138-B  
     horse racing, 8-137  
     Indians, 8-135; 7-\*214  
     location, 8-138-A  
     map, 8-498  
         on United States map, 7-595  
     motto, 8-138-B
- Kentucky**, state, U. S.—*continued*  
     name, 8-138-B  
     nicknames, 8-138-B  
     parks, 8-138-B  
     physical features, 8-138-A, 133  
     political facts, 8-138-A  
     products and industries, 8-137-38  
     rivers, 8-138-A, 134  
         underground, 1-\*89, 92  
     state bird, 8-138-B  
     state flower, 8-138-B  
     state song, 8-138-B  
     underground caves, 1-85, \*86
- Kentucky, University of**, 8-\*134  
     Memorial Hall, 8-\*134
- Kentucky and Virginia Resolutions** against Alien and Sedition Acts, 7-199
- Kentucky cardinal**, bird, 8-138-B
- "Kentucky Cardinal, The,"** by James Lane Allen, 4-132
- "Kentucky Home, My,"** song by Stephen Foster, 8-138-B
- Kentucky River**, Kentucky, 8-138-A
- Kenya, Mount**, Africa, 5-462  
     height, 1-29  
     map, 5-576
- Kenya Colony**, Africa, description, 5-462  
     British state, 5-461  
     map, 5-576
- Keokuk**, Iowa  
     canal, 8-124  
     elevation, 8-119
- Kepler, Johann**, life; scientific discoveries, main article, 13-398-99  
     and Galileo, 1-288, 290  
     studies of planetary motion, 1-106, †288-90; 13-399
- Keramos**, first potter, 12-42
- Kerensky, Alexander**  
     heads Russian government, 6-439  
     portrait, 6-\*439
- Kermes**, color, 12-157
- Kern River**, Calif., 8-42
- Kerosene**, 9-456; 10-389
- Kerosene thermometer**, 1-482
- Keswick Dam**, California, 8-43
- Ketch**, two-masted vessel, 10-\*167
- Kettering, Charles Franklin**, inventor, 10-4th color page opp. 174
- Kettledrums**, or **tympani**, 12-258-C
- Keuser, Anthony F.**, gifts to New Jersey, 8-252-A
- Kevin, Saint**, monastery founded by, 6-\*146
- Keweenaw Peninsula**, Mich., 8-186-A  
     mines, 8-185
- Keweenawan period**, geology, 1-40
- Key, Francis Scott**  
     portrait, 14-\*573  
     writing of "Star-spangled Banner," 14-573
- Key**, telegraph, 10-\*97, 99
- Key West**, Fla.  
     industries, 8-74

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Key West**—*continued*

- longest day, 1-202  
 resort city, 8-74  
 temperature, 8-76  
**Keyboards**, music, 12-258-D  
 piano, 12-258-E  
**Keyhole limpet**, mollusk, 3-145  
**Keys**, islands off Florida's coast, 8-76  
**Keys**, bronze, 12-\*21  
**Keystone**, in arch, 11-428  
**Keystone State**, nickname for Pennsylvania, 8-342  
**Khafre, king of Egypt**, statue, 11-†9, 14  
**Khafre**, pyramid, 11-\*10  
**Khans**, Tatar princes, in Russia, 6-426  
**Khartoum**, Anglo-Egyptian Sudan, 5-455  
**Khatti**, capital of Hittites, 5-115  
**Khedive**, head of Egyptian government, 5-73  
**Khian**, Hyksos king in Egypt, 5-61  
**Khingan Mountains**, Asia, maps, 5-581, 591  
**Khiva**, republic, U.S.S.R., 5-435  
**Khmers**, people of Indo-China, 5-19, 429  
**Khorsabad**, Assyria  
 archaeology, 5-14  
 Sargon's palace, 11-407  
**Khufu (Cheops)**, king of Egypt, 5-54  
**Khufu**, (Great Pyramid), 11-†409-10, \*10; 5-54, 185, \*186  
**Khut**, pyramid, 5-54  
**Khyber Pass**, between Afghanistan and India, 5-433  
 Greeks pour through, into India, 5-370  
 map, 5-585, O5  
**Kiang**, wild ass, 4-352, \*509  
**Kibitka**, Russian sleigh, 6-\*436  
**Kibo, Mt. (Kilimanjaro)**, Tanganyika Terr., Africa, 5-462  
 elevation, table, 1-25, 29  
 map, 5-576  
**Kickapoo Indians**  
 land grant, 8-317  
 Wisconsin, 8-440  
**Kicking**, in football, 14-517  
**Kidd, Captain William**, piracy, 5-379; 10-170  
**"Kidnapped,"** by Robert L. Stevenson, 13-265  
**Kidneys**, structure and function, 2-\*362, \*366, 367  
 color plate, 2-\*279  
**Kieffer pear**, 2-233  
**Kieft, William**, the Testy, governor of New Amsterdam, 8-†266, 272; 7-\*149  
**Kiel**, Germany, rubble, 6-\*241 A  
**Kiel, Treaty of**, gives Norway to Sweden, 6-407  
**Kiel Bay**, Europe, map, 6-599  
**Kiel Canal**, Germany, 10-274  
 map, 6-582  
**Kieseritzki**, chess player, game, 14-488  
**Kiev**, Russia, early history, 6-424, 425  
**Kilauea**, Hawaii, volcano, 1-†10  
**Kilauea Point**, Hawaii, lighthouse lens, 10-\*228  
**Kildare, Gerald the Great** (Garret More), Earl of, 6-149, 152

- Kildare, Gerald the Younger** (Garret Oge), Earl of, 6-152  
**Kildare, Thomas**, Earl of, 6-149  
**Kilimanjaro, Mt.**, *see* Kibo  
**Kill Devil Hill**, No. Carolina, beacon light, 7-414  
**Kill Devil Monument**, memorial to Wright brothers, 7-\*413; 8-296-A  
**Killarney, lakes of**, Ireland, 6-160  
**Killcohook Migratory Bird Refuge**, 8-252-A  
**Killdeer plover**, bird, 4-†116, 117  
 nest building and breeding, 4-117  
**Killer whales**, 4-\*444, 445  
**Kilmarnock poems** of Robert Burns, 13-210  
**Kiln**, brick, 9-†378  
**Kiln**, clay bring, 12-\*43, 44, \*45  
**Kiloliter**, 10-377  
**Kilometer**, 10-377  
**Kilowatt**, unit for measuring electricity, 1-523  
**Kilt fox**, 4-305  
**Kilts**, forbidden in Scotland, 6-132  
**"Kim,"** by Rudyard Kipling, 13-269  
**Kimberley**, Cape Colony, besieged in Boer War, 5-487, 488  
**Kimberley diamond mines**, 5-473-B; 9-430  
**Kimmei**, Japanese emperor, 5-345  
**Kimono**, Japanese, 9-\*19  
**Kindling point**, of fuels, 1-385  
**Kinetic energy**, 1-338, 339  
**Kinetoscope**, or kinescope, 10-†126 B, 502, 503  
**King, Ellen, Mrs.**, song written by, 8 436 B  
**King, Philip Parker**, exploration in Australia, 5-\*553  
**King, Rufus**, American senator and minister to England, 12-\*496  
**King, William Lyon Mackenzie**, Canadian premier, 7-29, 29-B, 29-C  
 biography, 6-567  
**King, William R.**, vice president of the United States, 12-456-G  
**King**, chess piece, 14-487  
**King**, *see* Kings *see also* names of various kings, as Arthur; James, etc  
**King Alphonso XII racing cup**, 10-173  
**"King and Collier,"** opera by Anton Dvořák, 12-309  
**"King Arthur,"** statue, by Peter Vischer, 12-\*21, 22  
**King Arthur stories**, *see* Arthur  
**King cobra**, 3-486  
**King crab** (Horseshoe crab, or Xiphosura), 3-190, 192, \*64  
**"King for a Day,"** opera by Verdi, 12-300  
**King grasshopper** (locust), 3-347  
**King Haakon Plateau**, Antarctica, map, 13-502-B  
**"King Hunger,"** by Leonid Andreyev, 13-97  
**King James (Authorized) Version of Bible**, *see* Bible  
**"King John,"** drama by Shakespeare, 13-158  
**"King Lear,"** by Shakespeare, 13-158, \*160  
**King Maker** (Earl of Warwick), 6-39  
**"King Oedipus,"** by Sophocles, 13-36  
**King of Beasts**, lion, 4-287

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- King of Birds**, eagle, 4-151  
**King of Fishes**, sturgeon, 3-228, 244  
**King of Kings**, title of Abyssinian ruler, 5-457  
**"King of the Golden Mountain,"** fairy tale, text, 14-†214-17  
**"King of the Golden River, The,"** by John Ruskin, 13-237  
**King penguin**, bird, 4-\*217, \*218, 221  
**King Philip's War**, 8-58  
**King snake**, 3-\*497, 502  
**King-te-Chin**, China, porcelain works, 12-42, 59  
**"King Throstlebeard,"** fairy tale, text, 14-†192-94  
     color plate, 14-\*192  
**King vulture**, bird, 4-\*160  
**Kingbird**, 4-†43 45  
     nest, 4-\*44  
**Kingdom of the Golden Horde**, 5-270  
**Kingfishers**, birds, 4-†48-50  
     color plate, 4-\*152, \*185  
     Greek myth about, 14-454  
     "laughing jackass," 4-\*42, 50  
**Kinglets**, birds, 4-173, †224-25  
**Kings**, government by, 7-347, 352, 353; 6-270, 355  
     Canute's ideals for king, 6-410  
     "divine right," 7-353  
     belief disappears with Charles I's execution, 12-409  
     James I of England, 6-60  
     Louis XIV, 7-354, 11-232  
     power controlled in Poland, 6-449  
     priest-kings of ancient Sumeria, 5-78  
**King's Canal**, Poland, 10 261  
**King's Canyon National Park**, California, 8-42-B; 7-407  
**King's College**, New York City, 10-\*559; *see also* Columbia University  
**King's cup**, in British Museum, 12-68, \*86  
**"King's Henchman, The,"** opera by Deems Taylor, 12-257; 13-352  
**King's Peak**, mountain, Utah, 8-391, 396  
**"King's Quair, The,"** by James I of Scotland, 6-118  
**King's River**, Calif., 8-42  
**King's ship**, galley, 10-\*158  
**"King's writing desk,"** 12-190  
**Kingsford-Smith**, Charles, aviator, portrait, 10-\*324  
**Kingsley**, Charles, life and works, 13-†246-47, 352; portrait, 13-\*246  
**Kingston-on-Thames**, England, Coronation Stone of Saxon kings, 6-\*42  
**Kingstown**, port of St Vincent, 7-66  
**Kinkajou**, animal, 4-324, †325  
**Kiolen Mountains**, *see* Kjölen  
**Kioto**, Japan, tea growing, 9-\*140  
**Kiowa Indians**, land grant to, 8-317  
**Kipling**, Rudyard, life and works, main article, 13-268-69  
     and British Empire, 6-101  
     "Captains Courageous," 9-365  
**Kipling**, Rudyard—*continued*  
     "Jungle Book," 13-269  
     verses from, 4-330  
     portrait, 13-\*269  
     "white man's burden," 6-101; 7-300  
**Kirby**, William, Canadian author, 7-29-11  
**Kirchhoff**, Gustav R., discoveries in light, 1-171  
**Kirghiz Soviet Socialist Republic**, 6-443-B  
**Kirghiz Steppes**, Asia, 5-336 B  
**Kish**, ancient city, Mesopotamia, 5-80  
**"Kiss, The,"** sculpture by Auguste Rodin, 11-\*347  
**"Kiss for Cinderella, A,"** by Sir James Barrie, 13-268  
**Kit fox**, 4-305  
**Kitchen**, electrical devices, 1-\*522  
     Swedish, 6-\*406  
**"Kitchen cabinet"** of Andrew Jackson, 12-513; 7-224  
**Kitchen middens**, 5-34; 6-372  
**Kitchen utensils**, ancient, 12-\*17  
**Kites**, birds, 4-157  
     in Oligocene period, 3-53  
**Kites and kite flying**, main article, 14-†499-502  
     directions for making kites, 14-†500-2  
     Japanese kites, 5-\*362  
     musical kites of China, 12-203  
     world wide use of, 14-499  
**Kitson**, Henry H., statue by, 11-\*376  
**Kittatinny Mountains**, 8-249  
**Kittatinny Valley**, 8-245, 249  
**Kittens**, *see* Cats  
**Kittery**, Maine, shipbuilding, 8-153  
**Kittiwake**, bird, 4-200, 203  
**Kitty Hawk**, N. C.  
     flight of Wright brothers at, 10-313, \*316  
     Kitty Hawk National Monument, 7-414  
     recommended for steady winds, 10-317  
**Kitty Hawk National Park**, Kitty Hawk, No. Carolina, 7-414  
**Kiushu**, *see* Kyushu  
**Kiva**, of Indian pueblo, 7-94  
**Kiwi**, bird, 4-\*11, †238  
     nest building and breeding, 4-239  
**Kiyomori**, Japanese chief, 5-349  
**Kjölen**, or Kiolen Mountains, Sweden, 6-407-B  
**Klamath Indians**, in Oregon, 8-328  
**Klamath Lake**, islands, Calif., pelicans, 4-\*185  
**Klamath Lake Bird Refuge**, 8-332  
**Klamath Mountains**, U. S., 8-331  
**Klamath River**, California and Oregon, 8-42, 331  
**Klamath River Valley**, 8-331  
**Klikitat Indians**, in Oregon, 8-327  
**Klip Kaffirs** (Bergdamares), inhabitants of Southwest Africa, 5-491-B  
**Klondike region**, Canada, gold rush, 8-13; 9-393; 13-\*340, 341  
**Knee**  
     camel, 4-\*397  
     horse, 4-508  
     joint, 2-\*320

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Knee—continued**

- reflex action in, 2-397
- structure, 2-396
- Kneph**, Egyptian god, 5-54
- Knickerbocker, Diedrich**
  - fictional character, 10-13
  - name used by Washington Irving, 13-294
- "**Knickerbocker History of New York**," by Washington Irving, scene from, 7-149
- Knickerbockers**, nickname for New Yorkers, 8-284-A
- Knife**, machete, 8-476
- Knight**, chess piece, 14-487
- Knight of the Red Lawns**, in Arthurian romances, 14-391
- "**Knights, The**," by Aristophanes, 13-39
- Knights and knighthood**, age of chivalry, 5-†306-8; 13-†145, †146
  - archery a deathblow to, 6-27
  - arms and armor, 13-\*103; 10-†352-56, \*359
  - swords, 14-512
  - Arthurian romances, 14-377, 383, 387, 393, 399; 13-145-46
  - castle life, *see* Castles
  - ceremony of knighthood, 5-307
  - coat of arms, 5-307
  - Don Quixote, 13-77
  - gunpowder the end of, 10-416
  - heraldry, 5-307
  - in ancient China, 5-321
  - initiation ceremony, 14-\*389
  - jousts, 10-†354
  - religion of, 11-94
  - service to Virgin Mary, 11-94
  - three-fold service, 14-393
  - see also* Arthur, legendary British king
- Knights of Labor**, 7-283
- Knights of St. John**
  - defense of Malta, 5-\*282; 6-476
  - lose Rhodes to Turkey, 6-478
- Knights of the Golden Circle**, 8-113
- Knights of the Round Table**, *see* Round Table
- Knights of the Sword, German**, 6-461 fol.
  - in Poland and Lithuania, 6-446, 447, 448
- Knitting**, lesson in, 14-†81
- Knob**, in physiography, 1-25
- Knossos**, *see* Cnossus
- Knot**, time telling by, 10-\*462, 469
- Knots**, hitches, splices, how made, 14-†555
- Knots in evergreen timber**, 2-97
- Knots**, of oriental rug, 12-152
- Know-Nothing party**, 7-244
- Knox, John**
  - and Mary Queen of Scots, 12-†399
  - influence in Scotland, 6-\*116, 121
- Knoxville, Tenn.**
  - manufacturing, 8-371
  - university, 8-367
- "**Knucklebone Players**," Greek painting, 11-50
- Knut the Holy**, king of Denmark, 6-410

- Knut the Mighty**, king of England and Denmark, 6-12, \*13, 409
  - subjects Norway to Denmark, 6-382, 410
- Knutsson, Karl**, becomes Charles VIII of Sweden, 6-397
- Knutsson, Torgils**, regent of Sweden, 6-395
- Koala**, Australian bear, 4-\*466, 467, \*474
- Kobe**, Japan, trade, 10-242
- Koblenz**, *see* Coblenz
- Kobuk River**, Alaska, 8-16
- "**Kodak City**," nickname for Rochester, N. Y., 8-280
- Kodiak**, Alaska
  - first school, 8-15
  - founded, 8-11
- Kodiak**, island and archipelago, Alaska, 8-16-A
  - first white settlement, 8-11
  - map, 8-560
- Kodiak bear**, 4-\*316
- Koehl, Hermann**, aviator, portrait, 10-\*324
- Koenig, Friedrich**, 10-77
- Koh-i-noor**, diamond, 9-430
- Kohl**, Egyptian cosmetic, 12-99
- Kohlrabi**, vegetable, cabbage family, 9-148, \*149
- "**Kojiki**" (Old Story), of Japan, 5-341, 346
- Kola**, peninsula, U.S.S.R., map, 6-602
- Komodo dragon**, lizard, 3-461, \*462
- Komyo**, Japanese emperor, 5-350
- Königsberg**, Germany, home of Immanuel Kant, 13-21
- Koong-Shee**, legendary maiden, 12-59
- Kootenai**, or **Kootenay, Indians**, 8-328
- Kootenay National Park**, Canada, 7-29-A
- Kootenay River**, tributary of Columbia River, rises in Canadian Rockies; flows S. into Montana and Idaho and back into British Columbia, length, 10-256; 8-92 A
- Koppers oven**, coking process, 9-445
- Koran**, sacred book of Mohammedans, 5-422
  - portrayal of animal forms forbidden, 12-56
  - taught in schools, 5-71, 423
  - written in Arabic, 5-417
- Korat**, plateau in Siam, 5-430-A
- Korea** (Chosen), country, Asia, 6-564
  - annexed by Japan, 5-335, 364
  - attacked by Japan, 5-344
  - coalition government, 6-562
  - conquered by China, 5-325
  - kite flying custom, 14-499
  - map, 5-581, 591
  - transportation methods, 10-130, \*131
- Korin**, Japanese artist, 5-359
- Kosava**, wind, 6-290-A
- Kosciusko, Thaddeus**
  - aids American Revolution, 6-452; 12-455
  - portrait, 12-\*455
  - released from prison by Czar Paul, 6-\*433
  - services to Poland, 6-452
- Kosciusko, Mt.**, Australia, in Australian Alps, 5-560-1; 1-\*26

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Kossuth, Louis**

- fights for Hungarian independence, 6-285 fol.  
 leads revolt against Austria, 6-269  
**Kotoku**, Japanese emperor, 5-346  
**Kotow**, Chinese bow, 5-331  
**Kotzebue Sound**, Alaska, map, 8-560  
**Koussevitzky**, Serge, 12-258  
**Kovno**, capital of Lithuania, 6-460, 464-B  
**Kowloon**, China, 10-265  
**Koyukuk River**, Alaska, 8-16  
**Kraals**, Zulu villages, 11-\*399  
**Krait**, snake, 3-486  
**Krakatoa**, volcanic island, East Indies, destruction of, 1-76  
**Kraken**, name for octopus and squid, 3-171  
**"Krakowiak,"** by Frédéric Chopin, 12-292  
**Krater**, Greek jar, 12-50; 11-\*35  
**Kreisler**, Fritz, violinist, 12-258  
 portrait, 12-\*256  
**Kremlin**, citadel at Moscow, 6-443; \*12-449-D  
**Kriemhild**, queen, in "Nibelungenlied," 14-310  
**Krishna**, philosophy of, 5-369  
**Krogmann, C. W.**, song, "Massachusetts" by, 8-176-B  
**Kruger**, Paul, rules Transvaal, 5-486, 488  
**Krupp ironworks**, 10-256  
**Krypton**, gaseous element in air, 1-376  
 symbol, atomic no. and wt., 1-\*551  
**Kshatriyas**, caste, of India, 5-368, 369, 372  
**Ku Klux Klan**, 7-†272; 8-370  
**"Kubla Khan,"** poem, by Coleridge, 13-218  
**Kublai Khan**, emperor of China, 5-328  
 attempt to invade Japan, 5-349  
 Polos at court of, 13-445, 446  
 splendor of empire, 5-437

**Kudu family**, antelopes, 4-\*417, \*421

**Kuenlun Mountains**, Asia, 1-29; 5-336-B  
 China, 5-336-A

map, 6-602; 5-590

**Kulkulcan**, Mayan god, 7-90

**Kulturkampf**, dispute over Catholic church, 6-232

**Kumquat**, fruit, 9-173

**Kun, Bela**, organizes soviet government in Hungary, 6-290

**Kung Ch'iu**, *see* Confucius

**Kung-fu-tse**, *see* Confucius

**Kunlun Mountains**, *see* Kuenlun

**Kunzite**, precious stone, color plate, 9-frontispiece

**Kuomintang**, Chinese political party, 5-336-A, 334, 335

**Kupe**, discovers New Zealand, 5-531

**Kuria Muria Islands**, Arabia, 5-336-D

**Kuriles**, Pacific islands, 6-443 A  
 map, 5-592

**Kuskokwim River**, Alaska, 8-16

**Kutenay Indians**, *see* Kootenai

**Kuwait**, British protectorate, 5-336-D

**Kwakiutl Indians**, 7-\*105; 10-\*331

**Kwangtung**, China, leased by Japan, 5-364-B

**Kwanyin**, Chinese goddess, statue, 5-\*325

**Kyathos**, Greek jar, 12-50

**Kyburg**, house of, 6-247

**Kylix**, drinking cup, 5-\*158; 12-50

**Kyoto**, Japan, former capital, 5-324

**Kyte's sewing machine**, 10-\*444

**Kyushu**, island of Japan, climate, 5-364-B  
 map, 5-593

L

**La Baye**, Wis., trading post, 8-440  
 renamed, 8-441

**"La Bella,"** portrait by Titian, 11-\*180

**La Bohème**, opera by Puccini, 12-253

**Laaland**, island, Baltic Sea, map, 6-599

**Labor**

- Chartist movement, 6-95  
 conditions after World War I, 7-333  
 conditions during Industrial Revolution  
   England, 6-84, 93  
   Scotland, 6-132  
   United States, 7-217  
 conditions under state control, 7-384  
 converted into money, 7-\*501  
 division of, 7-†497; 9-61  
 England, *see* England, labor  
 improvement of working and living conditions, 7-440, 312, 343  
 interdependence of worker and employer, 7-552  
 labor troubles result of Machine Age, 7-550

**Labor--continued**

- living conditions before World War I in U. S., 7-305  
 organized, *see* Guilds; Labor unions  
 proletariat; Marx's theories, 7-549-50; 6-443  
 slave, 8-409; *see also* Slavery  
 social legislation, 7-439  
 strikes, 7-563, \*560, \*562, \*540, 541  
   Pullman strike, 7-290  
   "sit-down," 7-\*561, 563  
 unemployment insurance, 6-102; 7-544  
 unions, *see* Labor unions  
 wages and hours, 7-439, 563  
 welfare work, 7-433, 444  
*see also* Child labor; Labor party; Strikes; Unemployment  
**Labor, American Federation of**, 7-561, 563, 283, 309  
**Labor, Department of**, U. S., 7-381  
 flag of Secretary, color plate, 14-facing \*571

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Labor Day**, 14-585  
**Labor laws**, Elizabethan, 6-53  
**"Labor Omnia Vincit,"** Virgil, 8-320-B  
**Labor party**  
   Australia, 5-560-A  
   England, 6-101, 108  
   New Zealand, 5-540, 541  
**Labor-saving devices**, *see* Machine Age  
**Labor Statistics, Bureau of**, U. S., 7-381  
**Labor Standards, Bureau of**, U. S., 7-381  
**Labor unions**, main article, 7-†558-63, 540  
   United States, 7-559-62, 244, 283, 309  
   West Virginia mining union, early, 8-436  
**Laboratories**  
   apparatus, 1-536  
   bacteriological, 2-\*13, \*19; 13-\*370  
   chemical, 1-\*550  
     **work accomplished in**, 10-†555-69  
   experiments with guinea pigs, 2-\*390  
   for sick fishes, 3-\*220  
   of nineteenth century, 1-\*282  
**Labore method** of artificial respiration, 2-†410  
**Labrador**, peninsula, No. Amer., in Province of  
   Newfoundland, general data, 7-29-B  
   area, 7-29-B; map, 7-593  
   Cabot's landing, 13-\*471, 472  
   climate, 7-29-B  
   Eskimos, 7-37  
   government, 7-29-B  
   iron, 9-408  
   location, 7-29-B  
   made part of Newfoundland, 7-32  
   people, 7-29-B  
   physical features, 7-29-B  
   rising of coast, 1-70  
   Strathcona's life in, 13-565  
**Labrador Center** of ice sheet, 1-†61  
**Labuan**, island of Malay archipelago, 5-430-B  
**Labyrinth** in ancient Crete, 14-448; 11-415  
   archaeologists discover, 5-16, 17; 11-32  
**Labyrinth of ear**, 2-\*282  
**Labyrinthodonts**, prehistoric reptiles, 3-33  
**"Lac, Le,"** by Lamartine, 13-123  
**Lace and lace making**, main article, 12-†163-72  
   Belgium famous for, 6-350  
   in convents and courts, 12-166, 172  
   most excellent type, 12-166  
   Portugal, 6-\*339  
   rayon, 9-86  
   uses, 12-164, 168, 172  
   Valenciennes lace, 12-\*165, 172  
**Lace lizard**, 3-460  
**"Lace Maker, The,"** painting by Vermeer, 11-\*269  
**Lace sponge**, 3-85  
**Lacedemonians**, Spartan people, 5-154  
**Laceleaf** (lattice leaf), plant, 2-201  
**Lacewing fly**, 3-†381-83  
**Lachesis**, one of the Fates, 14-412  
**Lachine**, Canada, Indian massacre, 7-6  
**Lachine Rapids**, St. Lawrence River, named by  
   Cartier, 7-136  
**Laconia**, district of Greece, on map, 5-\*150  
**"Laconic,"** origin of word, 5-155  
**Lacoste, René**, tennis player, 14-470  
**Lacquer**, of China and Japan, how applied, 9-291  
   carving of, 12-\*97, 100, †102  
   chests and cabinets, 12-192  
   greatest artists of, 5-359  
   soy bean oil in, 10-562  
**Lacrimonous apparatus of eye**, 2-\*292, 299, 300  
**Lacrosse**, game, main article, 14-†493  
**Lactic acid** 2-19  
   in blood, 2-331, 339, 340  
   waste product of muscles, 2-379  
**Lactic acid bacteria**, 9-341, 346  
**Lactobacilli**, 2-20  
**"Ladies' Peace,"** 6-176  
**Ladino**, Jewish language, 5-136  
**Ladislav, Saint**, king of Hungary, 6-279  
**Ladoga, Lake**, Europe, 6-464-B  
   map, 6-600  
**Ladrone (Marianas) Islands**, 8-471  
   discovered by Magellan, 13-463  
   Germany obtains, 5-522  
   map, 5-597  
**Lady Amherst pheasant**, bird, 4-187, \*189  
**"Lady and Child, A,"** painting by Romney, 11-\*303  
**"Lady and Gentleman at a Spinnet,"** painting by Vermeer, 11-\*269  
**"Lady Buttoneyes,"** poem by Eugene Field, 13-343, \*344  
**"Lady in Black,"** painting by William Chase, 11-\*363  
**Lady Jane Grey**, *see* Grey  
**Lady Macbeth**, Shakespearean character, played by Mrs. Siddons, 12-332  
**"Lady of the Lake, The,"** poem by Sir Walter Scott, 13-222  
**Lady of the Lakes**, nickname for Michigan, 8-186-B  
**"Lady with the Lamp"** (Florence Nightingale), 7-428  
**Lady's-slipper**, flower, 8-198-A  
**Ladybirds**, beetles, 3-335-36  
**Ladysmith**, Natal, in Boer War, 5-487, 488  
*Lacris*, defined, 2-184  
**La Farge, John**  
   paintings, 11-360, 364  
   of Confucius, 13-\*514  
   stained glass, 12-77  
**Lafayette, George Washington**, 12-456  
**Lafayette, Marie Joseph Paul, Marquis de**  
   aids American Revolution, 12-†450 fol.  
   Pershing at tomb of, 12-554  
   portrait, 12-\*451  
   with Washington at Mount Vernon, 12-\*452  
**Lafayette, Mount, White Mts., N. H.**, 8-242-A  
**Lafayette National Park**, *see* Acadia National Park  
**"Lafayette, we are here,"** 12-554  
**La Follette, Robert Marion**  
   political activities, 7-305, 311, 332; 8-445

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



- La Fontaine, Jean de, life and works, main article, 13-115-16**  
 contemporaries, 12-412  
 portrait, 13-\*115
- LaFontaine, Louis Hippolyte, 13-†566-67**
- Lagash, Babylonia, archaeology, 5-12**
- Lagerlöf, Selma, 6-407**
- Lagoons, 3-99; 5-521; 8-146**
- Laguna de Bay, see Bay, Laguna de**
- La Hontan, Louis Armand, Baron de, French explorer in America, 8-305; 13-580**
- Lahun, Treasure of, 5-8**
- "Laissez faire," theory of economics, 13-20**
- Lake, Simon P., 1-308, 310**
- Lake, body of water, see Lakes**
- Lake District, England, 6-108-B; 13-216; 10-\*9**
- Lake Dwellers, Swiss, see Swiss Lake Dwellers**
- Lake Erie, Battle of, 12-†499-500; 7-211, \*483**
- Lake Malheur Bird Refuge, 8-332**
- Lake Louise, Canada, 7-29-V**  
 color plate, 7-†23
- Lake Mattamuskeet Migratory Waterfowl Refuge, N. C., 8-296-A**
- Lake of the Woods, Minn., 8-198**
- Lake Placid, N. Y., tobogganing, 14-483**
- Lake school of poetry, 13-216, 218, 233; 10-\*9**
- Lake State**  
 nickname for Michigan, 8-186-B  
 nickname for Minnesota, 8-198-A
- Lake Success, United Nations home, 6-\*558**
- Lake trout, fish, 9-368**
- Lakehurst, N. J., port for aircraft, 8-246**  
 "Hindenburg," disaster, 10-\*318
- Lakes**  
 artificial  
   Bagnell Dam, 8-212-A  
   Hoover Dam, 10-532  
   Lake of Ozarks, 8-209  
   Panama Canal, 10-272, \*273  
 boiling, of Dominica island, 7-64  
 Dead Sea lowest in world, 1-92  
 during Ice Age, 1-61, 92  
 Finland "the land of a thousand lakes," 6-464-B, 456, 464  
 fishing in, 9-366, 368  
 Florida, 8-76  
 formation: change and end of, 1-92  
 greatest in the world, 1-44  
 Indiana, 8-116  
 Italy, 6-315-B  
 longest fresh-water, 5-464  
 Maine, 8-156  
 Minnesota, 8-190  
 New Hampshire, 8-238  
 New York State, 8-265-66  
 prehistoric  
   Lake Bonneville, 8-390, 391  
   Lake Dakota, 8-364  
 Russia, 6-443-A  
 "sinks," 8-34  
 South America, 5-518-A
- Lakes—continued**  
 tar, of Trinidad island, 7-66  
 underground, 1-92  
 United States, 7-343-D  
 wiped out or formed by earthquakes, 1-81  
*see also names of lakes, as Ontario; Tanganyika*
- Lakewood, N. J., health resort, 8-246**
- Lalique, René, glass decorations, 12-38**
- L'Allegro, see Allegro, L'**
- Lamaism, religion, 5-437, 439, 440**
- Lamarck, Jean Baptiste Pierre Antoine de Monnet de, life and work, main article, 13-418**  
 portrait, 13-\*418
- Lamartine, Alphonse Marie Louis de Prat de, life and work, main article, 13-123**  
 portrait, 13-\*123
- Lamas, Buddhist priests, 5-437, 439, 440**
- Lamb, Charles, life and works, main article, 13-†223-24**  
 "A Dissertation on Roast Pig," 5-314  
 essays, 13-224  
 friend of Coleridge, 13-217, 218  
 portrait, 13-\*224
- Lamb, Mary, life and works, main article, 13-†223-24; portrait, 13-\*224**
- Lambs, stock-market victims, 7-585**
- "Lame Duck Amendment" (Twentieth Amendment), 7-337**
- Lame goose, game, 14-174**
- "Lamia," by Keats, 13-231**
- Lamp clock, 10-\*462**
- Lamp shade, how to make, 14-†53**
- Lamp shells (brachiopods)**  
 first appearance on earth, 3-9, 15, 18, 24, 30, 64
- Lampblack, dye, 9-306**
- Lampman, Archibald, biography, 13-577-78**  
 portrait, 13-577
- Lampreys, fishes, 3-\*252**  
 prehistoric, 3-19
- Lamps**  
 Alpine, 2-418  
 ancient, 12-\*182  
 arc, 10-392  
 bronze, 12-\*15, \*21  
   in Old Stone Age, 5-30  
 candles, 10-†389  
 lanterns, 10-†388  
   lighthouses, 10-226, 228  
 oil, 10-†388  
 safety, for coal miners, 13-†383-84  
*see also Lighting*
- Lanai, island of Hawaiian group, 8-461**  
 map, 8-562
- Lancaster, Pa., manufactures, 8-339**
- Lancaster, house of, 6-34**  
 Wars of the Roses, 6-37, 39
- Lancaster Turnpike, 10-146, 153**
- Lancelot, Sir, in Arthurian legends and Gareth, 14-388**  
 in King Arthur's court, 14-396, 397  
 last days, 14-404  
 love for Guinevere, 14-382, 394, 401

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Lancelot, Sir**—*continued*

- loved by Elaine, 14-399
- madness and healing, 14-394
- original (according to some legends), 6-279
- rescue of Guinevere, 14-400
- tribute to, 5-307
- war with King Arthur, 14-402
- "Lancelot," poem by Robinson, 13-349
- Lancet windows**, 11-\*463, 464; 12-76
- Lancret, Nicholas**, 11-281
- "Land," derivation of word, 8-162-B

**Land**

- amount of earth's surface covered by, 1-†66
- beginnings of life on, 3-18
- fallow, 10-546
- farming, *see* Agriculture
- grazing, 7-455
- lifting and sinking of coasts, 1-†69-72
- measure, units of, 10-375
- ownership in socialism, 7-551
- prehistoric topography, 3-61
- proportion of earth's surface, 1-\*66
- real estate developments, 7-448
- rent, 7-537
- speculation in pioneer days, 8-307
- see also* Agriculture; Irrigation; Land grants; Land tenure

**Land breeze**, cause of, 1-†231**Land claims**, Northwest Territory, 7-176**Land Grant Act**, 7-456**Land grants**

- to homesteaders, 7-279, 281
- to railroads, 7-278, 279

**Land-locked salmon**, 3-\*249**Land of a Thousand Lakes** (Finland), 6-456**Land of Gold**, nickname for California, 8-42-B**Land of Opportunity**, nickname for New Mexico, 8-262-A**Land of Plenty**, nickname for South Dakota, 8-364-A**Land of Steady Habits**, nickname for Connecticut, 8-62**Land of the Cactus**, state, 8-262-A**Land of the Dakotas**, 8-302-A**Land of the Delight Makers**, 8-262-A**Land of the Mormons**, 8-396-A**Land of the Rising Sun** (Japan), 5-340**Land of the Rolling Prairies**, 8-124-A**Land of the Saints** (Utah), 8-396-A**Land of the Sky**, nickname for North Carolina, 8-296-A**Land rent**, 7-537**Land Tenure**, medieval, 5-293, 302**Land zeppelin**, 10-\*199**Landlords**

- disappearance in Ireland, 6-160
- power in England, 6-83, 95
- Landon, Alf M.**, presidential candidate, 7-341-B
- Landowners**, Roman, 7-348
- Landscape architect**, first, 11-491
- Landscape painting**, *see* Painting, landscape

**Landsdowne Manuscript** of "The Canterbury Tales," 13-\*144**Landseer, Sir Edwin**, art style, 11-319**paintings**

- "Dignity and Impudence," 4-\*502
- "Saved," 3-\*66
- scene depicting smithy's shop, 4-\*513
- "The Highland Shepherd's Chief Mourner," 11-\*319

**Lane, Franklin K.**, United States secretary of the interior**portrait**, 12-\*549**quoted**, 8-176; 14-575**Lane, Harriet**, niece of President Buchanan, hostess in White House, 12-563**Lane, Ralph**, 9-222**Roanoke colony**, 8-286**Lang, Anton**, as Christ, 12-\*328**Langdon, John**, American statesman, 12-\*496**Langdon, Olivia** (Mrs. Samuel L. Clemens), 13-330**Lange, Paul**, music to "Iowa" by, 8-124-A**Langland, William**, 6-34**Langley, Samuel Pierpont****airplanes invented by**, 10-\*316, 317**portrait**, 10-\*317**Langmuir, Irving**, physicist, 1-\*535, \*245**Language and languages**, origin, main article, 10-†1-7, 28**Africa**, 5-473-B**American Indians**, 7-108; *see also* Indian language**Asiatic**, 5-336-D**Basic English**, 10-7**deaf-mute alphabet**, 10-\*6**Eskimo speech**, 7-36**Esperanto**, 10-7**Grimm's Law**, 13-284**gypsy**, 5-390**history of the English language**, 10-†9-15**invented languages**, 10-6**Latin once universal**, 5-280; 10-11**origin and changing forms of words**, 10-†17-25**pidgin English**, 10-\*7**Romansch**, 6-254-B**slang**, 10-24, 510**South America**, 5-518-B**spoken in Europe during Middle Ages**, 5-270**theories of origin**, 10-1-3**universal**, 10-7**unrelated tongue of Basque peoples**, 6-317*see also names of languages, as Aramaic language; English language; Latin language***Langurs**, monkeys, 4-†256**Lanier, Sidney**, life and work, 13-335**Lanolin**, fat, 9-81**Lansing, Robert**, in Wilson's cabinet, 12-549**Lansing, Michigan**, 8-179**capitol building**, 8-\*179**Lantern fish**, 3-208**Lantern-slide projector**, use of lens in, 1-†433

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Lanterns**, 10-†388  
 iron, 12-\*5  
 lighthouse, 10-226, 228  
**Lanthanum**, element, symbol, atomic no. and wt., 1-\*551  
**Lao-tse (Li Erh)**, Chinese philosopher, life and teachings, 13-516-17; 5-319  
**"Laocoön,"** drama by Gotthold Lessing, 13-287  
**Laocoön group**, Greek sculpture, 11-\*48, 56  
**Laos**, state, in Indo-China, 5-427, 429, 430-A, 430-B  
**Laos cat (Siamese)**, 5-430-A  
**La Paz**, Bolivia, South America, 5-518-D  
**Lapidary**, stone cutter, 12-126  
**Lapis lazuli**, stone, used in mosaics, 12-109, 110  
**Lapithae**, mythological character, 14-\*447, 448  
**Laplace, Pierre Simon, Marquis de, life; scientific work**, main article, 13-405-6  
 Nebular Hypothesis, 1-5, 6  
 portrait, 13-\*405  
**Lapland**, district, Europe  
 cranes, 4-\*111  
 dwellings, 11-\*397, \*399; 9-\*377  
 footwear, 9-57  
 headdress, 9-\*93  
 location; climate, 6-405, 380, 381, 407-A  
 midnight sun, 10-\*476  
 reindeer, 6-\*380, \*381, \*405; 10-134  
 storehouse on stilts, 6-\*403  
 trade, 6-\*381  
*see also* Lapps  
**Lapland longspur, bird**, 4-†128 fol.  
**La Plata**, old Spanish district in South America, 5-500  
 Argentina once part, 5-505  
 pampas, 5-494  
 split into republics, 5-507  
**La Plata River**, *see* Plata River  
**Lappet sponge**, 3-85  
**Lapps**, people  
 driven from Finland, 6-456  
 Norway, 6-407-A  
 racial origin; education, 6-\*380  
*see also* Lapland  
**Lapwing**, bird, 4-175  
**La Rabida monks** give aid to Columbus, 13-†447  
**Laramie**, Wyoming, 8-449  
 University, 8-449  
**Laramie, Fort**, Wyoming, fur-trading station, 7-233  
**Laramie Mountains**, range in Colorado and Wyoming, 8-449  
**Larch**, tree, 2-99, \*267  
 wood, 9-257  
**Large intestine**, 2-\*335, 358, 367  
**Largs, Battle of**, 6-\*112, 113  
**Läringen, dukes of**, 6-247  
**Lark**, bird  
 graph of song, 4-\*5  
 horned larks, 4-223  
 meadow lark, 4-\*9, †86-87, \*224  
 not true lark, 4-87

**Lark**, bird- *continued*  
 nest building and breeding, 4-87  
 skylark, 4-172  
**"Lark, The,"** Diesel train, color plate, 10-opp. 174  
**"Lark Ascending, The,"** by George Meredith, 13-263  
**Lark bunting**, state bird of Colorado, 8-52-B  
**La Rochefoucauld, François**, Duc de, French courtier of Louis XIV's court, 12-412  
**Larsa**, ancient Sumerian city, 5-80  
**Larva stage of insects**  
 ant grub, 3-321  
 ant lion grub, 3-383  
 army worm (caterpillar), 3-373, 374  
 bee grub, 3-298, \*300, 301, 304  
     honey bee, 3-313  
 beetle grub, 3-†331, †335, 336, 338, †339, 340, \*342 \*343  
     useful, 3-334  
 butterfly caterpillar, 3-277, \*278, 281, \*282-83, \*381  
 caddis worm (caddis fly), 3-392  
 cicada grub, 3-\*371, 372  
 daddy longlegs, 3-364  
 diver beetle grub, 3-399  
 dragon fly grub, 3-390  
 drone fly (rat-tailed maggot), 3-365  
 flower fly grub, 3-364  
 hairy caterpillar (vestal tiger moth), 3-\*270  
 Hessian fly, 3-360  
 horse fly, 3-\*388  
 house fly maggot or grub, 3-†358  
 lacewing fly grub (aphis lion), 3-382  
 mosquito, 3-\*363  
 moth, 3-\*270, 287 fol.  
 nymphs, 3-\*274, 372, 388, \*389  
 scavenger beetle grub, 3-401  
 silk spun by caterpillars, 3-288  
 tsetse fly grub, 3-365  
 wasp, 3-\*298, 307  
**Larynx**, vocal organ, 2-337  
**La Salle, René Robert Cavalier, Sieur de, life; explorations**, main article, 13-†485-86; 7-\*137, 139  
 Arkansas claimed, 8-28  
 Fort St. Louis founded, 8-111  
 Illinois, 8-96  
 Louisiana, 8-141  
 Missouri, 8-208  
 Ohio, 8-305  
 on the "Griffon," 7-\*4  
 portrait, 7-\*3  
 Tennessee, 8-367  
 Texas visited, 8-377  
**Las Casas, Bartolomé de**, 7-80  
**Las Vegas, Nevada**, 8-230  
**Lassen, Mount**, 8-42-B  
**Lassen Volcanic National Park**, 8-42-B; 7-407  
**Lassus, Orlandus**, 12-222  
**Last Chance Gulch**, Montana, early mining settlement, 8-215, 217

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- "Last Days of Pompeii," novel by Bulwer-Lytton, 12-110
- "Last Judgment," painting by Michelangelo, 11-157, 162
- "Last Leaf, The," poem by Oliver Wendell Holmes, 13-309
- "Last of the Mohicans, The," novel by James Fenimore Cooper, 13-297
- "Last of the Romans" title given Boethius, 13-58
- "Last Sigh of the Moor," hill near Granada, Spain, 6-325
- "Last Supper"  
 painting by Leonardo da Vinci, 11-\*149, 152  
 painting by Titian, 11-\*179
- Lastman, Pieter, teacher of Rembrandt, 11-271
- La Tène period of ironwork, 12-8
- Late blight, plant disease, 2-\*137
- Latex of rubber tree, 9-263, 266, \*270  
 unloading at pier, 10-248
- Lathe of cabinetmaker, 12-176
- Laths, building, 9-\*384
- Latimer, Hugh, execution, 6-48
- Latin America, origin of name, 5-497
- Latin church, *see* Roman Catholic church
- Latin language  
 alphabet, 10-\*44, 45  
 calendar adopts words from, 10-482  
 influence upon other tongues, 6-319; 10-11  
 Middle Ages, spread of, 5-270, 280  
 once universal, 10-11  
 why used in botany, 2-183
- Latin League, 5-205
- Latin literature  
 "Silver Age," 6-319  
*see also* Roman literature
- Latins, people, modern application, 5-518-C; 6-162-D
- Latins, people, 5-192, 198, 205  
 relations with Etruscans, 5-189, 192
- Latitude, 7-343-C
- Latitudes, horse, 1-225
- Latium, ancient district in Italy, home of Latins, 5-192
- Latona, goddess, and Niobe, 14-457
- La Trobe, Charles Joseph, portrait, 5-\*554
- Latrobe, Benjamin Henry, introduces Greek architecture in America, 11-511, 512
- Latter Day Saints, *see* Mormons
- Lattice leaf (laceleaf), plant, 2-201
- Latvia, country, Europe, description and history, 6-\*460, +462-63; general data, 6-464-A  
*see also* index World War II, 6-493  
 area, 6-464-A  
 climate, 6-464-A  
 farming, 6-+462  
 flax festivals, 6-463  
 government, 6-464-A  
 language, 6-464-A  
 location, 6-464-A  
 maps, 6-600, 571  
 merchant marine, number, 10-232  
 people, 6-464-A
- Latvia, country, Europe—*continued*  
 physical features, 6-464-A, 460  
 provinces, 6-464-A  
 river transportation, 10-259  
 Russia recognizes independence, 6-439  
 trade, 10-259
- Laud, William, archbishop of Canterbury, imprisonment and execution, 6-+63
- Laughing (black-headed) gull, bird, 4-201, \*202, \*203
- "Laughing Cavalier, The," painting by Frans Hals, 11-\*263
- "Laughing Fisherboy," painting by Frans Hals, 11-\*263
- Laughing hyena, 4-308, \*309
- Laughing jackass (kingfisher), 4-\*42, 50
- Launcelot, *see* Lancelot
- "Laundress," painting by Dammier, 11-\*331
- "Launfal, Sir, The Vision of," by James Russell Lowell, 13-313
- La Union, port of Salvador, 7-46
- "Laura," beloved of Petrarch, 13-+62
- Laura Spelman Rockefeller Memorial, 12-583
- Laurel tree, in Greek mythology, 14-440
- Laurentian Highlands, Canada, between St Lawrence River and Hudson Bay, 1-28; 7-33-A, 33-M, color plate, \*22  
 Adirondacks part of, 8-264  
 Superior old land a part, 8-438
- Laurentian Library, Florence, 10-556
- "Laurentic," ship, gold rescued from, 10-524
- Laurier, Sir Wilfrid, Canadian statesman, biography, 13-\*572-73; portrait, 13-573
- Lautrec, Henri Marie Raymond de Toulouse-, *see* Toulouse-Lautrec Monfa, H. M. R. de
- Lava, composition, 1-75  
 Great Dike, Colo., 1-\*38  
 igneous rocks, 3-2  
 unusual formations, 7-417  
 Craters of the Moon National Monument, 8-92-A  
 Vesuvius lava field, 1-+8
- Lava Beds National Monument, 8-42-B
- Laval, Pierre, French premier, 6-202, 511, 539
- Lavassor and Panhard, cars made by, 10-278
- Lavender, plant, in perfumes, 9-\*299, 301
- La Vérendrye, *see* Vérendrye
- Lavoisier, Antoine Laurent, life and works, main article, 13-+380-81; portrait, 13-\*381  
 studies of oxygen, 1-373; 2-333; 13-381  
 theory of matter, 1-283
- Law, John, Scot financier in France, 8-28, 141
- Law  
 civil, 7-387; 8-332  
 Code Napoléon, 7-355; 12-432  
 codified, 7-388  
 common law, 7-386  
 criminal law, 7-388; 8-332  
 Hammurabi's Code the first in history, 5-86  
 importance to man, 5-29  
 Justinian Code, 5-405

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Law—continued**

- more important than rulers, 7-353
- primary election law, 8-445
- social legislation, 7-439
- Solon's, 5-160
- \*state laws, 7-385, 386-88
- statute law, 7-387
- United States Constitution, text, 7-185
- Law Courts**, London, 6-90
- Law-making bodies** in representative governments, 7-357
- Law of definite proportions**, chemistry, 1-283, 553, 555, 557
- Law of gravitation**, *see* Gravitation
- Law of Moses** 5-119, 120, 126, 137
  - interpretation by rabbis, 5-133
  - observance in modern age, 5-138
- Law of perspective**, 1-114
- La Warre**, English estate, 8-66-A
- Lawn bowls**, game, 14-†492
- Lawn tennis**, game, 14-\*465, 466
- Lawrence, Saint**, protector of soldiers, 11-90
- Lawrence, Sir Thomas**, 11-304, 324
  - paintings
    - "First Commission, The," 14-\*59
    - "Miss Baring," 11-\*303
    - Queen Charlotte's portrait, 11-\*302
- Lawrence, Thomas Edward**
  - Arabian experiences, 5-401, 414
- Lawrence, Kansas**, burned, 7-248
  - Indian school, 8-132
  - university at, 8-127
- Lawrence, Mass.**, industries, 8-173
- "Lawrence," Perry's ship, 12-499, 500; 7-484
- "**Lay of the Last Minstrel, The**," by Sir Walter Scott, 13-222
- "**Lays of Ancient Rome**," by Macaulay, 13-235
- Lea, Margaret** (Mrs. Sam Houston), 12-516
- Leacock, Stephen**, Canadian author, **biography**, 13-†579-81; 7-29-1; portrait, 13 580
- Lead**, South Dakota, gold, 8-361
- Lead**, element, 9-†417-18
  - and radium, 1-43, 283; 9-417, 425, 426
  - Galena, Ill., 8-99
  - industrial uses, 9-418
    - mixed with tin, 9-420
    - stained glass windows, 12-74, 76
  - melting point, 1-\*392
  - silver ore contains, 9-389
  - symbol, atomic no. and wt., 1-\*551
  - where found, 9-418
    - Europe, 6-162-1)
    - United States, 7-343-E
      - Arizona, 8-22
      - Idaho, 8-89
      - Missouri, 8-211
      - Nevada's output, 8-233-34
      - Utah's output, 8-395
      - Wisconsin, 8-441-42, 444
- Lead azide**, explosive, 10-417
- Lead pencil**, materials in, 1-1; 9-258

- Lead shot**, how made, 1-360
- Lead state**, state nickname for
  - Colorado, 8-52-B
  - Missouri, 8-212-B
- Lead tetraethyl**, added to gasoline, 10-548
- Leadbeater's cockatoo**, bird, 4-192
- Leaf**, botany, *see* Leaves
- Leaf bud**, 2-132
- Leaf chafers**, insects, 3-338
- Leaf coral**, 3-\*101
- Leaf-cutting insects**, 3-†302, 304
- Leaf insects**, 3-351, †352
- Leaf mosaic**, 2-\*43
- Leaf-nosed bat**, 4-274
- Leaflets of compound leaves**, 2-\*24
- League**, measure, 10-375
- League of German Princes**, 6-223
- League of Nations**, established, 7-328
  - Abyssinia joins, 5-458
  - Canada a member of, 7-29
  - Danzig under protection of, 6-469
  - Denmark a member of, 6-416
  - England and dominions become members of, 6-106
  - Ethiopian crisis, 6-315, 498
  - Finland joins, 6-457
  - Japan withdraws from, 5-336, 364
  - Rhineland demilitarized, 6-499
  - Russia in, 6-443
  - Spain wins seat in Council, 6-335
  - United States' cooperation, 7-337
  - Woodrow Wilson's efforts for, 12-552, 553
- Leahy, Admiral**, U. S. Navy, 6-518, \*548
- Lean-to**, camper's, 14-\*557
- Leander Boat Club** of England, 14-533
- Leandro**, comedy character, 12-329
- Leaning Tower of Pisa**, 11-\*454
  - Galileo proves law of falling bodies from, 1-\*290, 292; 13-397
- Leap year**, 10-477, 481, 482
- Lear**, hero of "King Lear," 13-\*160
  - played by Richard Burbage, 12-330
- Learned, Ebenezer, Dr.**, library gift, 10-558
- "**Learned Ladies, The**," by Molière, 13-112
- Learning**
  - Middle Ages, 5-271, 278
  - spread by printing, 10-56
  - see also* Education
- Lease, Mary Ellen**, 7-291
- Least bittern**, bird, 4-105, \*110
- Least flycatcher**, bird, 4-42
- Least tern**, bird, 4-\*207
- Leather**, main article, 9 \*66-72; 7-\*534
  - by-products, 9-67
  - carving in, 12-107
  - house covered with, 11-\*398
  - how to care for; industry, 9-72
  - manufacturing center, 7-577
  - parchment, 9-274
  - skins used for, 9-†66, \*69, †72
  - tanning, 9-†66-68, †70-71; 7-577

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Leather—continued**

- uses and kinds, 9-70
- vellum, 9-274
- Leather flapper**, bat, 4-273
- Leather upholstery**, utilized by automobile industry, 10-562
- "Leatherheads,"** nickname for Pennsylvanians, 8-342
- Leathernecks**, name for Marines, 7-493
- Leatherstocking**, Cooper's hero, 13-296
- Leathery turtle**, 3-478, †480
- Leavenworth**, Kansas, city, 8-130
- Leavenworth**, Fort, Kans., army schools, 7-478
- Leaves**, main article, 2-†23-26, \*48, †52, 53
  - aquatic plants, 2-200, \*201
  - breathing contrasted with photosynthesis, 2-50
  - chlorophyll in red or purple, 2-55
  - classification, 2-23-24
  - color, 2-26
  - conifers, 2-98
  - cross section showing cells, 2-\*26
  - digestion by, 2-53
  - drinks made from, 9-138
  - fern, 2-†87 fol.
  - fossilized, 3-\*60
  - gases exchanged by, 2-49, 50
  - largest and smallest, 2-252
  - monocotyledons, 2-144
  - pattern made by, 2-\*43
  - photosynthesis, 2-\*42, 43
  - pungent odors, 2-175
  - shape and margin, 2-24, \*25
  - simple and compound, 2-†24
  - stipules, 2-133
  - sugar made by, 2-236, 238
  - transpiration, 2-51
  - trembling, of aspen, 2-263
  - venation, 2-25, †26
  - water content, 2-259
- "Leaves of Grass,"** by Walt Whitman, 13-327
- Lebanon**, Arab state, 5-401, \*108
  - flag, color plate, 14-following 570, no. 42
- Lebanon Mountains**, Syria, 5-108, 112; 3-3
- Lebanon Valley**, Penn., 8-341
- Le Brun**, Charles, painting by, 11-239
  - designs for gold- and silversmiths, 12-90
  - director-general of art at Versailles, 11-232
  - directs Gobelins, 12-144
  - Salon de la Guerre named by, 11-489
- Le Brun**, Marie Anne Élisabeth Vigée, portraits by, 11-†289
- Le Conte pear**, 2-233
- Lechfield**, Battle of, 6-278
- Lechwe waterbuck**, 4-\*419
- Lecompton Constitution**, 12-456-B
- Lee**, F., Confederate general, portrait, 7-\*257
- Lee**, Henry (Light Horse Harry), 12-525
- Lee**, Mary Custis (Mrs. Robert E. Lee), 12-525
- Lee**, Richard Henry, motion for colonial independence, 7-166
- Lee**, Robert Edward, biography, main article, 12-†525-26, 539
  - birthplace preserved, 8-418-A
  - capture of John Brown, 12-534
  - in Civil War, 12-526; 7-258 fol.
  - monument, equestrian, 8-\*406
  - portraits, 12-\*525; 7-\*257
  - president of Washington and Lee University, 8-417
  - surrender at Appomattox, 12-526; 7-265
- Lee**, Sergeant, in Revolutionary War, 10-308
- Lee family** in Virginia, 12-525
- Leech**, worm, 3-\*399
- Leech Lake**, Minn., 8-198
- Leeds**, Eng., manufactures, 10-254
  - map, 6-572, E3
- Leek**, vegetable, 9-150
- Leeuwenhoek**, Anthony van, life and work, main article, 13-†362-63
  - discoveries made with microscope, 2-278; 10-488
- Leeward Islands**, West Indies, 7-62-64; general data, 7-54 A -54B
- Left**, political term, 7-335
- Left-hand turn**, driving, 2-442
  - diagram, 2-444
- Leftist novelists**, 13-355
- Leg**, *see* Legs
- Legaspi**, Miguel López de, conquers Philippines for Spain, 5-564
- "Legend of Leonora, The,"** by Sir James M. Barrie, 13-268
- "Legend of Sleepy Hollow, The,"** by Washington Irving, 13-294
- Leghorn**, white, breed of chicken, 9-\*350
- Legion of Honor**, French order
  - bestows cross upon Corot, 11-332
  - cross refused by artists, 11-338
- Legislative** functions of government, 7-357
- Legislatures**, lawmaking bodies, 7-357, 385
  - see also subhead* political facts under states
- Legitimists**, French political party, 6-200
- Legnano**, Battle of, 6-\*209
- Legros**, Alphonse, 10-65
- Legs**, human
  - bandages for, 2-\*407
  - muscles and tendons, 2-\*330, \*331, color plate, \*326
  - nerves, 2-\*376, \*393
  - veins, 2-\*376, color plate, \*327
- Legs of animals**
  - crustaceans, 3-175, 186
  - flightless birds, 4-232, †234
  - insects, 3-273, \*305, \*346, †397 fol.
  - kangaroo, 4-460
  - spider family, 3-406
- Leguia**, Augusto B., 5-516
- Legumes**, botany, 2-168
  - soil benefited by, 10-546
- Lehigh River**, Pa., 8-341
- Lehman Caves National Monument**, 8-234-B; 7-417; 1-\*85

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Leibnitz, Gottfried Wilhelm von**, life and philosophy, main article, 13-14-15  
discovery of calculus, 13-15; 10-425  
portrait, 13-\*15
- Leicester, Robert Dudley**, earl, and Queen Elizabeth, 6-54, 55; 12-395
- Leichhardt, Ludwig**, attempts to cross Australia, 5-552
- Leif the Lucky**, *see* Ericsson, Leif
- Leipzig, Germany**, 10-257  
map, 6-582, E3
- Leipzig, Battle of**, 6-226; 12-432
- Leisure**, free time  
Aristotle; quotation, 13-10  
leisure time activities, *see* Contents Volume 14; *and also* Nature Study
- Leitmotif in music**, 12-250
- Lekythos**, Greek jar, 12-50
- Leland Stanford University**, Palo Alto, Calif., 8-41
- Lemmings**, animals, 4-168, 305
- Lemna** (duckweed), size and structure, 2-249
- Lemon juice**, used for invisible writing, 14-143
- Lemons**  
substitute for vegetables, 14-554  
vitamins, 9-175  
where grown; uses, 9-170, 175
- Lemurs**, monkeys, 4-†267-69  
in Eocene period, 3-52
- Lena River**, Siberia, rises in Baikal Mts. and empties into Arctic Ocean  
basin area, 10-257  
length, 10-253  
map, 5-581  
temperature of delta, 5-336-C
- Lenape Indians**, *see* Delaware Indians
- L'Enfant, Pierre Charles**, 11-511  
plans drawn for Washington, D. C., 7-446
- Lenglen, Suzanne**, tennis champion, 14-464, 470
- Lenin, Nikolay**  
death, 6-442  
leader of Russian Revolution, 6-438, 439  
portrait, 6-\*439  
Third International founded by, 6-442
- Leningrad** (formerly St. Petersburg), U.S.S.R., building of: changes in name, 6-\*429, 430, 441; 12-415  
commerce and industries, 10-261  
map, 6-600  
Soviet Library, 10-560
- Lenni-Lenape Indians**, 8-64
- Le Nôtre, André**, park at Versailles planned by, 11-233, 480, 491
- Lenox chinaware**, 12-61
- Lens, Battle of**, 6-\*183
- Lens, of eye**, 1-\*436; 2-\*296, †297, \*299  
eye troubles, 1-437, 438
- Lens of sand**, oil found in, 8-129
- Lenses**  
achromatic, 13-377  
ancient, 12-27  
camera, 10-447, †449, \*450
- Lenses—continued**  
eyeglass, 1-437, †438  
foci and focal distance, 1-430, †432-34  
kinds: made up of prisms, 1-431  
lighthouse lamps, 10-†228  
microscope, 10-†485-86  
passage of light, 1-427, †430, †431-34
- Lent**, period of fasting, 14-581
- Lenticels** of stem, 2-31
- Lentil**, vegetable, 9-150
- Leo I**, the Great, pope  
and Attila, 5-\*268  
relations of pope and emperor, 5-276
- Leo III**, pope  
Charlemagne crowned by, 12-370  
relations with Charlemagne, 12-\*368, 369
- Leo X**, pope  
Luther excommunicated by, 13-543  
overworks great artists, 11-168  
tapestries ordered by, 12-142
- Leo III**, the Isaurian, Byzantine emperor, 5-406
- Leo (Lion)**, constellation, 1-178  
star maps showing  
Jan. and Feb., 1-178-A, 178-B  
July and August, 1-178-G  
March and April, 1-178-D  
May and June, 1-178-F  
zodiac, 1-\*170
- León, Ponce de**, quest for fountain of youth, 7-119  
Porto Rico, 8-475
- Leon**, former kingdom, Europe, 6-322, 338, 340
- Leonardo da Vinci**, *see* Vinci, Leonardo da
- Leonidas**, king of Sparta, defends Thermopylae, 5-\*163, 164
- Leonids**, meteors, 1-167
- Leopard**, animal, 4-†291-92, 296; 5-\*368
- Leopard cat**, 4-†294
- Leopard frog**, 3-\*421
- Leopard seal**, 4-335
- Leopold I**, Holy Roman emperor, 6-263, 284
- Leopold II**, Holy Roman emperor, 6-264  
attempts to organize crowned heads against France, 6-224  
recalls reforms of Joseph II, 6-284
- Leopold II**, king of Belgium, Congo Free State promoted by, 5-468
- Leopold III**, king of the Belgians, residence, 6-350
- Leopold I**, of Babenberg, becomes ruler of Austria, 6-258
- Leopold II**, the Handsome, of Babenberg, 6-258
- Leopold III**, of Babenberg, 6-258
- Leopold IV**, of Babenberg, 6-258
- Leopold V**, duke of Austria, and Richard the Lion-hearted, 12-373
- Leopold VI**, duke of Austria  
death, 6-259  
return from crusade, 5-\*281
- Leopold of Hapsburg**, defeated by Swiss, 6-248
- Leopold III**, of Hapsburg, war with Lucerne, 6-248

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Leopold, E. A.**, music to "Connecticut State Song" written by, 8-62
- Leovigild**, king of the Visigoths, 6-319
- Lepage, Jules**, *see* Bastien-Lepage, Jules
- Lepanto, Battle of**, 6-303, 327
- Leper colony**, Philippine Islands, 5-570
- Lepidus, Marcus Aemilius**, triumvir of Rome, 12-362  
struggle for leadership in Rome, 5-225
- Lepita**, mushroom, 2-\*73
- Leprosy**, partial cure for, 9-219-A
- Lerna**, hydra of, myth, 14-428
- Le Sage, Alain René**, life and works, main article, 13-116  
portrait, 13-\*116
- Lesbian leaf**, ornament, 11-\*425
- Lesbos**, Isle of, home of Sappho, 13-30  
Sappho's school, 13-\*32
- Lesseps, Ferdinand de**, digs Suez Canal, 10-270
- Lesser Antilles**, *see* Antilles, Lesser
- Lesser scaup duck**, color plate, 4-\*120
- Lesser yellowlegs**, bird, 4-116, \*117
- Lessing, Gotthold Ephraim**, life and works, main article, 13-287
- Leste**, desert wind, 6-491
- Lethe**, mythological river, 14-424
- "L'Etoile du Nord"**, motto of Minnesota, 8-198-A
- "Letter, The"**, painting by Gerard Terburg, 11-\*267
- Letters**  
of Hammurabi, 5-86  
Sumerian, 5-78
- Letters**, carriage of, *see* Postal service
- "Letters from My Windmill"**, by Alphonse Daudet, 13-133
- Lettish**, language of Latvia, 6-464-A
- Letts**, people of Latvia, 6-464-A, 460
- Lettuce**, vegetable, 9-150  
experiment with, 2-\*257
- Leucadian Rock**, Ionian Isles, Sappho on, 13-\*31, 32
- Leucocytes**, white blood corpuscles, 2-349
- Leucoryx**, antelope, 4-\*419
- Leuthen, Battle of**, 6-221
- "Levana and Our Ladies of Sorrow"**, by Thomas De Quincey, 13-233
- Levante**, desert wind, 6-491
- Levees of Martha Washington**, 12-559, 560
- Leverrier, Urbain Jean Joseph**, discovery of Neptune, 1-158
- Levers, physics, principles of operation; classes**, 1-†324-28  
principle used in scales, 10-372  
problems, 1-327
- Lewes, George Henry**, English writer, and George Eliot, 13-261
- Lewes River**, North America, 8-16
- "Lewis"**, name, from same source as "Louis," 8-146-A
- Lewis, John L.**, labor leader, 7-563
- Lewis, Meriwether**, life, main article, 13-†491-92; 7-220  
expedition to the Pacific, 13-†491-92; 7-†207, \*209, 220; 12-506  
portrait, 13-\*492
- Lewis, Sinclair**, author, 13-350  
background of period, 7-335  
portrait, 13-\*345
- Lewis and Clark Cavern National Monument**, 8-220-A
- Lewis and Clark expedition**, 13-†491-92; 7-207, \*209, 220  
Columbia River explored, 8-326  
Dakotas explored, 8-360  
encouraged by Jefferson, 12-506  
Idaho visited, 8-88  
Montana visited, 8-216
- Lewis's woodpecker**, 4-72
- Lewiston**, Idaho, elevation, 8-88
- Lewiston, Ill.**, Indian mounds, 8-96
- Lewiston, Maine**, factories, 8-154
- "Lex Regia"** of Denmark, 6-415
- Lexicographer**, defined, 10-17
- Lexington, Ky.**, industries, 8-138  
home of Henry Clay at, 12-\*519  
university at, 8-134
- Lexington, Mass.**  
juvenile library, 10-558  
monument to minutemen, 7-\*355
- Lexington, Va.**, university at, 8-417
- Lexington, Battle of**, 7-\*163, 164
- Lexington Plain**, *see* Blue Grass region, Kentucky
- Leyden**, Holland, 6-354
- Leyster, Judith**, painting by, 11-\*263
- Leyte**, island, So. Pacific Ocean, 5-568-A  
map, 5-595
- Lhasa**, capital of Tibet, 5-439
- Lhut, Daniel Greysolon, Sieur du**, French trader, 8-191
- Li Erh**, *see* Lao-tse
- Li Po**, Chinese poet, 5-326
- Li Yuan**, Chinese emperor, 5-324
- Liability of corporation members**, 7-524
- Liana**, vine, growth, 2-263
- "Liber Veritatis"**, sketch book of Claude Lorrain, 11-230
- Liberal**, political term, 7-335
- Liberal party**  
Canadian, 7-25, 26, 29  
English, 6-95; 12-449-C  
Hungarian, 6-285  
Mexican; given power, 7-84
- Liberation, Army of, So. Amer.**, 12-438
- Liberation, War of**, 6-225, 226
- Liberator of South America**, *see* Bolivar, Simon
- Liberia**, free state, Africa, description, 5-472  
flag, color plate, 14- following 570, no. 43  
founded, 5-470  
independent state, 5-448  
map, 5-574  
trade, 5-455

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Liberty**

- struggle for in United States, 12-451  
*see* Freedom; Religious freedom
- Liberty, Statue of, 8-284-A**
- "Liberty and Independence,"** motto of Pennsylvania, 8-342
- "Liberty and Prosperity,"** motto of New Jersey, 8-252-A
- "Liberty and Union, Now and Forever, One and Inseparable,"** motto of North Dakota, 8-302-A
- "Liberty, Equality, and Fraternity,"** motto of French republic, 6-194
- "Liberty, Essay on,"** by John Stuart Mill, 13-239
- Liberty, Statue of, New York, 7-\*402**
- Liberty Bell, 7-†172, \*192, 14-†585**
- Liberty Bonds, 7-529**
- "Liberty Guiding the People,"** painting by Delacroix, 11-329
- Liberty Island, *see* Bedloe Island**
- Liberty Loans, 7-324**
- "Liberum veto" in Poland, 6-448, 452**
- Libia (Libya), dependency, Africa, description, 5-455, 473-B**  
 division of Barbary Coast, 5-451  
 map, 5-575  
 race, 5-43  
 secured by Italy, 6-309  
 trade, 5-455
- Libra (Balance), constellation, 1-178**  
 on star map, 1-178-F  
 zodiac, 1-†170
- Libraries, main article, 10-†555-62**  
 American Library Association, 10-561  
 ancient, 10-555; 9-273  
   Assyrian, 5-14, 92  
   Egyptian, in Alexandria, 10-556; 5-72, 181, 182  
   Sumerian, 5-78  
 Australia, 5-560 F, 560-G  
 card catalog, 10-561  
 children's, 10-558  
 exhibits, 10-560  
 Dewey decimal system, 10-561-62  
 Massachusetts, 10-556, 558; 8-176-A  
 monastery, 5-308; 10-556  
 New York City, 8-284  
 public, growth, 10-556-60  
   first in America, 12-465, \*467  
   specialized, 10-561  
   travelling, 10-558  
   University of Illinois, 8-\*95  
   University of Wisconsin, 8-\*440
- Library of Congress, Washington, D. C., 10-555, 561; 7-381**  
 required to supply books for blind, 10-560
- Library schools, 10-561**
- Libretto, of opera, 12-250**
- Libya, *see* Libia**
- Libyan Desert, table, 1-25; map, 5-575**
- Libyan pharaohs, in Egypt, 5-68**

- License plates, on automobiles and other motor vehicles, taxes, 7-389**
- Lichens, intermixed plants, main article, 2-†78-80**  
 artificial, 2-80  
 four types, 2-\*80  
 protection against drought, 2-207  
 symbiosis, 2-58
- Licinius, Caius Flavius Valerius, Roman emperor, 5-440**
- Lick, James, 1-105**
- Lick Observatory, Mount Hamilton, California, 1-\*105**
- Licking River, Ky., 8-138-A**
- Liddell, Alice (Alice in Wonderland), portrait, 13-\*266**
- Lie, Trygve, first secretary general of United Nations, 6-555**
- Liebig, Justus von, life and work, 13-†387-88**
- Liechtenstein, state, Europe, 6-467, †468**
- "Lieder," songs of Germany, 12-244**
- Liège, Belgium, 6-351**
- Life**  
 beginnings on earth, 3-6, 9; 1-96  
   land life, 3-18  
 biological chemist studies, 10-545  
 essentials of, 1-373, 14-549  
 decaying, humus made of, 1-97  
 dependence upon peculiar expansion of water, 1-483  
 dependence upon sun, 1-386  
 development shown in strata containing fossils, color plate, 3-frontispiece
- difference between animate and inanimate things, 2-†278-80**  
 five essentials for, 1-373  
 protoplasm, the living substance, 2-7, 279  
 Redi's experiments and discoveries, 2-278  
 Spallanzani's discoveries, 13-371  
*see also* Reproduction
- Life, philosophical beliefs about**  
 Aristotle; Philosophic principles, 13-9-10  
 Diogenes; poverty essential, 13-10  
 Epicurus; happiness essential, 13-10  
 Plato's "Republic," 13-7  
 Socrates, 13-3, 5  
 Stoics, 13-11
- "Life and Voyages of Columbus, The,"** by Washington Irving, 13-294
- "Life for the Czar, A,"** opera by Michael Glinka, 12-254
- "Life of a Hero, The,"** tone poem by Richard Strauss, 12-316
- "Life of an American Fireman, The,"** first photograph, 10-506
- "Life of Johnson, The,"** by James Boswell, 13-196
- "Life of Man, The,"** play by Leonid Andreyev, 13-97
- "Life of Nelson,"** by Robert Southey, 13-220
- "Life of the Bee, The,"** by Maurice Maeterlinck, 13-99

- "Life of Wesley,"** by Robert Southey, 13-220
- "Life on the Mississippi,"** by Mark Twain, 13-329, 330
- Life saving,** 2-†409
- artificial respiration, 2-†408-10
- Lift pump,** operation, 1-\*464, 465
- Ligaments,** anatomy, bones connected by, 2-318, 323
- Light, history of illumination,** main article, 10-†387-93; *see also* Lighting
- Light, physics, nature and theories,** main article, 1-†412-20
- absorption, 1-†428 fol.
- analysis of, by spectroscope, 1-\*185, †187
- at ocean depths, 1-66
- color of, what determines, 1-419, 438
- diffraction, 1-\*423
- diffusion, 1-140, †175 fol., 428
- effect on plants, 2-†43, 46, 50 fol., \*194, 223
- form of energy, 1-\*345, 349
- Fraunhofer's discoveries, 1-171
- how light behaves,** 1-†422 34
- how sun's rays strike the earth, 1-†208
- Huygens' wave theory, 1-†415 fol.; 13-377
- in Capri grottoes, 1-87
- life dependent upon, 1-373
- looming, 1-†425
- mechanical pressure, 1-162
- Newton's theory, 1-415; 13-†401
- produced by animals, 3-208, \*209, 343;  
*see also* Phosphorescence
- radium gives off, 9-426
- reflection, 1-†422 fol.
- refraction, 1-†271, †424 fol.
- reproduced by electric current, 10-124
- sound changed into, 10-504, \*506
- speed, 1-155, 179, †446
- measurement of, 1-417
- swiftest thing in the universe, 1-179
- sun's light, first created, 1-3
- transmission, 1-†428
- white light separated, color plate, 1-\*434, 438  
*see also* Lighting; Photosynthesis; Spectrum;  
Sunlight
- Light, artificial**
- effect on colors, 1-440
- effect on plants, 2-46, 223
- Light, cold,** *see* Luminescence; Phosphorescence
- Light and shadow in art**
- Baroque use of, 11-180, 243, 273
- Flemish painting, 11-194, 195
- Impressionists' use of, 11-345
- Leonardo da Vinci's mastery of, 11-151
- spotlight effects of the Tenebrists, 11-†247 fol.
- sunshine and Italian art, 11-108
- Venetian painting, 11-172, 180
- Light beam,** 1-423
- Light Brigade** at Balaklava, 6-\*98
- Light Horse Harry** (Henry Lee), 12-492
- "Light of the World, The,"** painting by Holman Hunt, 11-\*316, 320
- Light rays,** 1-423
- bent in diamonds, 9-429
- direction, 10-448, †449
- from planets and stars, 1-175
- how they enter diamond, 9-\*430
- "Light That Failed, The,"** by Rudyard Kipling, 13-269
- Light waves**
- frequency, 1-418
- length, 1-418, \*419
- determine colors, 1-438
- Light year,** defined, 1-172, 183
- Lighthouses,** main article, 10-†226-29
- ancient, 10-226
- "birdladders" on, 4-4
- Eddystone, 12-†557
- how to make model, 14-†34
- Pharos of Alexandria, 5-181, \*186, 187; 10-226
- signals and calls, 10-229
- United States lighthouse service, 7-488-B
- Lighting,** main article, 10-†387 93
- candles, 10-†389
- city streets, 7-397
- chemist's contributions, 10-549
- colored, 10-392
- electric light, 10-390, †392, †393; 13-443
- voltage used, 1-510
- gas light, 10-†390, \*391
- oil lamps, 10-†388
- stage, 12-334
- "Lightnin',"** moving-picture, 10-\*502
- Lightning,** 1-†245 fol.
- conductors and nonconductors, 1-247
- controlled by seeding clouds, 1-\*249
- form of energy, 1-340
- Franklin's experiment with, 1-\*493, 495; 12-465; 14-500
- how to avoid danger from, 1-248
- "Lightning,"** clipper ship, 10-173
- Lightning bug,** *see* Firefly
- Lightning rods,** 1-248
- invented by Franklin, 12-465
- Lights, traffic,** 2-442
- Lightships,** 10-\*228, 229
- Lignite,** coal, 9-438; 6-162-D
- Ligurian Sea,** Italy, map, 6-588
- Ligurians,** people, 6-164
- Liim Fiord,** Denmark, map, 6-598
- Lilac**
- pollination, 2-112
- purple, New Hampshire's state flower, 8-242-B
- Lilienthal glider,** 10-\*316, 317
- Lilium speciosum rubrum,** 2-\*147
- Liliuokalani,** Hawaiian queen, 8-460
- Lille,** France, map, 6-579, H2
- Lilliput, land of,** in "Gulliver's Travels," 14-343
- Lilliputian,** origin of term, 14-343
- Lily, flower,** 2-\*146-48, 151; Easter, 6-\*490
- Lily, sacred,** of Africa, 2-\*183
- Lily of the valley,** 2-\*147
- Lily pads,** 2-200, \*201

- Lima, Peru**  
 center of Spanish government, 5-498  
 Grau San Martin sets up independent gov-  
 ernment in, 5-505  
 rainfall and temperature, 5-518-D
- Lima bean, vegetable**, 9-150  
 pale, 9-\*151
- Limas, shellfish**, 3-157
- Limburger cheese**, 9-348
- Lime, fruit**, 9-173
- Lime**  
 among hair cells of ear, 2-283  
 coral reefs contain, 1-56  
 fossils contain, 3-6, 14  
 Foraminifera shells, 3-44  
 manufacture, 9-†384  
 purification of water with, 10-542  
 stalactites formed by, 1-86  
 tooth formation requires, 2-315
- Lime, carbonate of**, *see* Limestone
- Lime, sulphate of**, 1-54
- Lime salts in blood**, 2-348
- Lime tree, age**, 2-260
- Limelight**, 10-390
- Limerick, Articles of**, 6-161
- Limerick, Battle of**, 6-147
- Limerick, city and county in Ireland**, Treaty  
 Stone, 6-\*161
- Limerick (tambour), lace**, 12-172
- Limestone (carbonate of lime), formation of**,  
 1-51, 52  
 a source of carbon dioxide, 2-45  
 bluffs of Malay Peninsula, 5-430-A  
 Carboniferous, 3-27, 30  
 caves caused by action of water on, 1-†84-87  
 cement made from, 9-384  
 converted into marble, 1-51  
 coral, 3-99  
 coral found in, 1-57  
 coral polyp's use of, 3-97  
 Devonian rocks contain, 3-24  
 dust used in mines, 9-\*440  
 England's cliffs of, 3-\*12  
 fertilizer, 7-455  
 Florida, 8-69  
 Foraminifera shells, 3-79; 1-51  
 formed in Eocene period, 3-51  
 geologic eras found in, diagram, 1-40  
 Indiana, 8-112, 114  
 marine worms' use of, 3-118, 121  
 New York State, 8-266  
 ocean contains, 3-78, 97  
 plates of sea cucumber, 3-139  
 quicklime made from, 9-384  
 relation between marble and, 1-52  
 riddled by sponges, 3-86  
 sandstone contains, 1-95  
 sedimentary rock, 3-27  
 shells formed of, 3-78, 143  
 used in iron smelting, 9-\*402  
 where quarried, 9-380
- Limeys (English sailors)**, 2-364
- Limited-liability corporations**, 7-524
- Limited monarchy**, 7-348
- Limiting factor, photosynthesis**, 2-44
- Limoges, France**  
 center of enameling, 12-66  
 kaolin deposit, 12-61
- Limon Bay, Panama, map**, 10-268-B
- Limpet, mollusk**, 3-144  
 fresh-water, 3-260  
 varieties; life cycle, 3-145
- "Limping Devil, The," "rogue novel," by Le**  
 Sage, 13-116
- Limpopo (Crocodyle) River, Africa**, 5-491-B  
 map, 5-577
- Lincoln, Abraham, president of the U. S., life**,  
 main article, 12-†527-32, 456-1)  
 administration, 12-532; 7-†252-65  
 assassination, 7-265  
 attitude toward Union and slavery, 7-241  
 birthday a holiday, 14-578  
 birthplace, 12-527, \*528; 8-418  
 boat operated by, 10-\*220  
 boyhood and education, 12-†527-29  
 Civil War, 12-532; 7-†253 fol.  
 confidence in Grant, 12-538  
 debates with Douglas, 12-531; 7-250  
 elected in 1860, 7-250  
 Emancipation Proclamation, 12-532  
 First Inaugural, 7-255  
 Gettysburg Address, 12-\*531, 532  
 dedication of cemetery, 7-414  
 Howells' life of, 13-331  
 memorial at Gettysburg, 7-\*267  
 portrait bust, 7-\*241  
 Second Inaugural Address, 12-531  
 Springfield monument, 8-\*96  
 statue, 7-\*255  
 by French, 11-\*360  
 by St. Gaudens, 11-\*359, 364  
 Walt Whitman's dirges for, 13-327  
 wife, 12-563
- Lincoln, Mary Todd (Mrs. Abraham Lincoln)**,  
 character; as First Lady, 12-563  
 gown worn by, 9-\*15  
 portrait, 12-\*562
- Lincoln, Robert, portrait**, 12-\*562
- Lincoln, Sally**, 12-527
- Lincoln, Thomas**, 12-527; portrait, 12-\*562
- Lincoln, William, portrait**, 12-\*562
- Lincoln, Nebr., industries**, 8-226
- Lincoln Building, New York**, 11-\*517
- Lincoln County War**, 8-260
- Lincoln Highway**, 10-156
- Lincoln Memorial, Washington, D. C.**, 11-\*521;  
 12-\*527
- Lincoln Tube, New York City**, 10-\*202, 207
- Lind, Jenny**, 12-\*252, 579
- Lindbergh, Charles Augustus**  
 flight to Paris, 10-320  
 portrait, 10-\*322
- Linden-leaf tea**, 9-138

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Lindisfarne** (Holy Island), monastery founded on, 6-9
- Lindisfarne Gospels**, 11-†84
- Lindsay, Vachel**, poet, 13-350  
quoted, 5-467
- Line of Demarcation, Papal**, 5-496
- Linear measure**, 10-375
- Lineated pheasant**, bird, 4-†189
- Linen**, main article, 9-†46-48; 6-†162-A  
flax cells that form linen, 2-†8, 9  
found on mummies, 9-†47  
paper made from, 9-275 fol.  
preparation of, and uses, 9-†47
- Linen-fold design**, 12-†185
- Lines of magnetic force**, 1-†502
- Lingua franca**, language, 5-473-B
- Lingual tonsil**, 2-†308
- Linkstrand, Vicke**, glassware, 12-†38
- Linnaeus (Carl von Linné)**, life and work, main article, 13-†410-11  
citrus fruits classified by, 9-175  
plant classification, 2-182-85  
portrait, 13-†411  
"Species Plantarum," 2-185
- Linnet** (house finch), 4-†132, 135
- Linoleum**, 10-546  
made from linseed oil, 9-312
- Linotype**, typesetting machine, 10-53, \*58, 60, 78, 81
- Linseed**, 9-47
- Linseed oil**, uses, 9-312
- Lint**, cotton, 10-404
- Linters**, cotton, 9-34  
artificial fibers made from, 10-546
- Linum** (flax plant), products derived from, 9-312
- Lion**, animal, *see* Lions
- Lion**, constellation, *see* Leo
- Lion, Gulf of the**, France, map, 6-581
- Lion marmoset**, 4-267
- "Lion of Lucerne"**, sculpture by Thorvaldsen, 6-†250
- Lion of St. Mark**, Venice, 11-487
- Lion of the North** (Gustavus Adolphus of Sweden), 6-400
- Lion-tailed monkey**, 4-258
- Lioness, wounded**, Assyrian carving, 11-†26
- Lions**, 4-†285 fol., \*475; 5-†445  
drawing and mounting, 14-†68  
ferocity, 4-289, 290  
love of catnip, 2-175  
mountain lion, 4-†294  
Nemean lion, 14-426  
sculpture by Barye, 11-†332  
sculpture of, unearthed in Babylon, 5-†89
- Lion's Den State**, nickname for Tennessee, 8-374
- Lippershey, Hans**, invents telescope, 1-103
- Lippi, Filippino**, painting of St. Bernard's vision, 13-†534
- Lippi, Fra Filippo**, paintings, 11-136, 138  
painting of Madonna, 11-†134
- Lips**, anatomy, sense of touch, 2-291
- Lipton, Sir Thomas**, sportsmanship, 14-530
- Liquefaction of gases**, 1-†405
- Liquid air**, how made, 1-†405
- Liquid measure**, 10-375
- Liquids**, 1-403 fol.  
Archimedes' Law, 1-†467, 470  
arrangement of molecules in, 1-†403, 405  
boiling point, 1-†392  
capillarity, 1-†359, 360  
compared to gases, 1-537  
compared with gases and solids, 1-535  
dew, 1-†240, \*241  
difference between solids and, 1-354  
diffusion, 1-360  
electrolysis, 1-500  
evaporation and heat absorption, 1-405, 408  
heat expands or contracts, 1-482  
how we put liquids to work, 1-†363-70  
hydraulic press, 1-†368  
Law of Archimedes, 1-470  
Pascal's principle, 1-368  
poor heat conductors, 1-397  
pressure, 1-†365-69  
raindrops, 1-†241, 246  
sound conducted by, 1-446  
specific gravity, 1-†474  
surface tension, 1-†360  
two liquid elements, 1-538  
why solids float or sink in, 1-†467-74
- Liquor**, legalization of, 7-336, 341
- Liquor control** (prohibition)  
Canada, 7-29  
United States, 7-†335
- Lira**, Italian currency, 6-312, 314
- Liriodendron (tulip) tree**, view of stem sections, 2-†33
- Lisa, Manuel de**, 8-224  
in Montana, 8-217  
in Nebraska, 8-224
- Lisbon**, Portugal, 6-338  
location by Lat. and Long., 6-342-A
- Lisle, Rouget de, Claude**, *see* Rouget de Lisle
- Lister, Joseph, baron**, life and work, main article, 13-372  
honored by Sorbonne, 13-†368  
portrait, 13-†372
- Liszt, Cosima** (Frau Richard Wagner), 12-†296, 298
- Liszt, Franz**, life and works, main article, 12-†297-98, 246  
and Brahms, 12-302  
and Chopin, 12-292  
and Wagner, 12-295, \*296, 297  
in Vienna, 6-273  
portraits, 12-†241, \*297  
praise of Edward MacDowell, 12-322
- Liter**, measure, 10-377
- Literal number**, algebra, 10-433
- Literary Club**, London, Dr. Johnson's, 13-†194, 195 199  
Sheridan a member of, 13-206

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

## Literature

**biographies**, 13-†26-355; *see also* Contents  
Volume 13 and names of famous writers  
in index

**contemporary American**, 13-†345-55

**drama**, 12-†324-34; *see also* Drama

**naturalism**, 13-346, 347

**realism**, *see* Realism, literature

**romanticism**, 6-86; 13-215, 218; 12-332

*see also* Mythology; Novels; Poetry, etc.; *the literature of countries, as* German literature, *and the names of writers, as* Molière; Shakespeare

**"Literature and Dogma,"** by Matthew Arnold, 13-255

**Lithium**, element, 9-418

atomic structure, 1-\*541, 542

chemical behavior, 1-547

symbol, atomic no. and wt., 1-\*551

**Lithobius**, centipede, 3-266

**Lithography**, 10-†66

**Lithuania**, country, Europe, description and history, 6-†459-60; general data, 6-464-A-464-B

area, 6-464-A

Christianity adopted, 6-448

climate, 6-464-B

costume, 6-\*460, 9-†23

headdress, 9-†88

government, 6-464-B

history, 6-459-60

role of Vytautas, 6-†461

independence recognized by Russia, 6-439

*see also* index World War II, 6-493

location, 6-464-A

maps, 6-600

on map of Europe, 6-571

people, 6-464-B

love of song, 6-463

physical features, 6-464-B, 460

products, 6-464-B

rivers, 6-464-B

Tentonic Knights in, 6-446

united with Poland, 6-447

**Litmus paper**, 2-80

**Little America**, Antarctica, equipment for explorations in, 13-\*511

map, 13-502-B

**Little Bear** (Ursa Minor), constellation, 1-178 known to Thales, 13-2

star maps showing

Jan. and Feb., 1-178-A

July and August, 1-178-G

March and April, 1-178-C

May and June, 1-178-E

Nov. and Dec., 1-178-K

Sept. and Oct., 1-178-I

**Little Big Horn, Battle of**, 8-220-A

**"Little Book of Western Verse, The,"** by Eugene Field, 13-344

**"Little Bo-Peep Has Lost Her Sheep,"** nursery rhyme, text, color plate, 14-174-E

**"Little Boy Blue,"** nursery rhyme, text, color plate, 14-174-K

**Little clarinet**, musical instrument, 12-258-B

**Little Colorado**, river of Southwestern United States, 8-24, 262

**Little Crow**, Indian leader, defeat at Wood Lake, 8-193

**Little Diamond Island**, Bering Strait, bird colony, 4-\*200

**Little Dipper**, constellation, *see* Little Bear

**Little Dog**, constellation, star maps showing:

Jan. and Feb., 1-178-B

March and April, 1-178-D

May and June, 1-178-F

Nov. and Dec., 1-178-K

**"Little Dorrit,"** by Charles Dickens, 13-245

**"Little Fadette,"** by George Sand, 13-130

**Little fountain**, soft spot in infant's head, 2-324

**"Little Geste of Robin Hood, The,"** poem, 14-354

**Little Geyser**, Iceland, 1-32

**"Little Ida,"** medallion by Charles Calverley, 11-\*377

**Little Ida** (Idaho), 8-92-B

**"Little Jack Horner,"** nursery rhyme, color plate, 14-174-F

**Little John**, in story of Robin Hood, 14-354

**Little Kanawha**, river, W. Va., length, 8-436-A

**"Little masters,"** Dutch school of painting, 11-262, 266

**"Little Men,"** by Louisa May Alcott, 13-321

**"Little Mermaid,"** fairy tale, text, 14-†231-33

**Little Miami River**, Ohio, 8-312-A

**Little Minch**, channel, Scotland, map, 6-574

**"Little Minister, The,"** by Sir James M. Barrie, 13-268

**"Little Miss Muffet,"** nursery rhyme, color plate, 14-174-I

**Little Orphan Annie**, character by James W. Riley, 13-338

**Little Owyhee River**, U. S., 8-234-A

**Little Peedee River**, North and South Carolina, 8-356

**"Little Red Riding-Hood,"** fairy tale, text, 14-†249-51

color plate, 14-\*249

**Little Rhody** (Rhode Island), 8-347

**Little Rock**, Arkansas, 8-26, 28

birthplace of MacArthur, 12-555-H fol.

capitol building, 8-\*26

during Civil War, 8-28

rainfall and temperature, 8-30-A

**"Little Sea-Maid, The,"** by Hans Christian Andersen, 3-72

**Little Tennessee**, river, U. S., 8-296

**"Little Tuk,"** fairy tale, text, 14-†207-8

**"Little White Bird, The,"** by Barrie, 13-268

**"Little White Girl,"** painting by Whistler, 11-359

**"Little Women,"** by Louisa May Alcott, 13-321

**Littleway process shoes**, 9-61, \*62

**Liturgical plays**, 12-326

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Liu Pei**, Chinese war lord, 5-322  
**Liu Tsu**, Chinese empress, 9-36; 5-315  
**Live oak**, trees, 2-160  
**Live stock**, 7-453, 461, 463  
   animal products, 10-546  
   butchering, 9-328.  
   centers for industry  
     Iowa, 8-123  
     Montana, 8-219  
     Nebraska, 8-225, 226  
     North Dakota, 8-301  
     Oregon, 8-329  
     South Dakota, 8-362  
     Texas, 8-381  
     Wyoming, 8-452  
   inspection, 9-\*327  
   transportation, 9-326, \*327  
   *see also* Meat industry, and kinds of animals  
     *used for meat*, as Cattle; Sheep  
**Live wire**, how to release shock victim from, 2-411  
**Liver**, anatomy, 2-361, \*362, 367  
   bile made by, 2-357  
   capillaries in, 2-374  
   contact of blood with cells, 2-346  
   function, 2-357, 367  
   position in body, 2-335, \*352, color plate, \*279  
**Liver**, food, given to anaemic patients, 2-345  
**Liver of fish**, 3-\*233  
**Livermore Valley**, Calif., grapes grown, 8-\*35  
**Liverpool**, England  
   dock works, 10-246  
   map, 6-572, D3  
   port, 10-253  
**Liverpool-Manchester line**  
   building of, 10-†185-87  
   Stephenson's locomotive wins prize on, 10-181  
**Liverwort**, plant structure, 2-\*84, 85  
**"Lives of the Poets, The,"** by Samuel Johnson, 13-195  
**Livia**, wife of Augustus Caesar, 5-232; 12-363  
**Living alphabet**, game, 14-158  
**"Living Buddha"** of Urga, 5-438  
**"Living fireworks,"** phosphorescence, 3-112  
**Living room**, modern, 12-\*199  
**Livingston**, Harriet, 10-218  
**Livingston, Robert R.**  
   arranges Louisiana Purchase, 7-206  
   backs Robert Fulton's steamboat venture, 10-218, 220  
**Livingstone, David**, life, main article, 13-†551-54  
   African explorations, 5-461, 468  
   champions native Africans, 5-484  
   Victoria Falls discovered by, 5-486  
**Livy (Titus Livius)**, life and works, main article, 13-†55-56  
   contemporaries, 5-229  
**Lizard State**, nickname for Alabama, 8-8-A  
**Lizards**, main article, 3-†447-63  
   a "living fossil," 3-\*33, 34  
   behavior of tail, 3-448  
**Lizards- continued**  
   blood-squirting, 3-457  
   flying, 3-450  
   in zoo, 4-479  
   legless, 3-458  
   number of species, 3-447  
   pads on toes of, 3-449, 456  
   prehistoric, 3-†433-34  
     modern type developing, 3-57  
     shoes of, 9-72  
**Llamas**, animals, 4-\*399, 400; 5-\*504  
**Llano Estacado**, *see* Staked Plain  
**Llanos**, sections of Venezuela, 5-518-E  
**Llewellyn ap Griffith**, Welsh prince, defies England, 6-139  
**Llewellyn ap Iorwerth**, the Great, Welsh prince, and Magna Charta, 6-139  
**Lloyd George, David**, portraits, 6-\*104; 12-\*550  
   friend of Churchill, 12-449-C  
**Loam**, composition, 1-96  
**Loans**, bank, 7-516, 520  
**Loblolly**, pine, turpentine and rosin from, 9-309  
**Lobsters**, 3-†185-87, \*189  
   how caught, 9-\*369  
   kindred of prehistoric Trilobites, 3-10  
**Lobster's horn**, a sea fir, 3-105  
**Location**, in moving pictures, 10-508  
**Lochner**, Stephan, painting by, 11-\*206  
**Locke**, John, English philosopher, draws South Carolina's constitution, 8-350  
**Lockjaw**, disease, 2-14, 21  
**Lockout**, 7-563  
**Locks**, canal  
   Göta Canal, 10-\*270  
   Kiel Canal, 10-274  
   Panama Canal, 10-270, \*271  
**"Loco weeds"**, harmful to cattle, 2-205  
**"Locomotion,"** Stephenson's locomotive, 10-\*180, 181  
**Locomotive Springs Migratory Bird Refuge**, 8-396-A  
**Locomotives**, invention, main article, 10-†175-78, 277  
   chemist's contributions, 10-548  
   Diesel engine used, 10-276, 4 pages opp. 174  
   energy lost by, 1-351  
   first used on railways, 10-†179-83, \*186 fol.  
   how switched and kept on rails, 10-\*187  
   how to make, 14-†36  
   modern, 10-\*175, \*185, \*186, \*191  
   parade of, at Baltimore, 10-183  
   stream-lining, 10-\*175  
   "Tom Thumb," 10-183, \*188  
**Locris**, district of Greece, on map, 5-\*150  
**Locust**, tree, 2-\*275  
   leaf, 2-\*24  
**Locusts**, insects, 3-†345-48, †367-71, \*376  
   how music is produced, 3-345  
   how to tell from grasshoppers, 3-348  
   life cycle, 3-†371  
   methods of checking, 3-369  
   plagues, 3-367

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Lodestones**, 1-485, 486  
**Lodge, beaver**, 4-373, \*375  
**Loeffler, Charles Martin**, 12-257  
**Loess**, soil, 8-223; 6-368-A  
**Loetschberg tunnel**, Alps, 10-204  
**Lofoden Islands**, Arctic Ocean, map, 13-502-A  
**Log**, nautical, 10-469  
**Log**, ship's record, 10-173  
**Log cabins**, 7-\*140, \*146; 9-\*377; 11-499  
     home of Abraham Lincoln, 12-†528, \*529  
**Log jam**, 9-252  
**Logan, John Alexander**, 14-584  
**Logan**, Mount, Canada, height, 1-27  
     map, 7-592, F5  
**Logan County**, Ohio, glacial hills, 8-307  
**Loganberry**, 9-158, \*159  
**Logbrig**, law rock of Iceland, 6-418  
**Loges, François des**, *see* Villon, François  
**Loggerhead shrike**, bird, 4-\*229  
**Loggerhead turtle**, 3-478, \*479  
**Logging**, 7-\*309, color plate, \*29-J  
**Logging camps**, main article, 9-†246-53  
**"Logopandekteison,"** by Urquhart, 10-6  
**Logwood**, dye obtained from, 9-306  
**"Lohengrin,"** opera by Wagner, 12-251, 295  
**Loin cloth**, article of clothing, 9-5  
**Loire River**, France  
     length, 10-253  
     map, 6-578  
**Lollards**, followers of Wycliffe, 6-†33, 35, 36, 41  
**Lo Lo Pass**, Idaho, 8-88  
**Lolowan**, Dutch East Indies, native dances, 5-\*521  
**Loma Tina**, mountain peak, Dominican Republic, height, 1-28  
**Lombard League**, defies Frederick I, 5-298; 6-209  
**Lombard Plain**, Italy, 6-315-B  
**Lombard Street**, London, origin of name, 5-298  
**Lombards**, Germanic people, 5-268  
     checked by Franks, 6-168  
     invasion of Italy, 6-294  
     subdued by Charlemagne, 12-369  
**"Lombards, The,"** opera by Verdi, 12-300  
**Lombardy**, dist., Italy, war against Frederick Barbarossa, 6-297  
**London, Jack (John Griffith London)**, life and works, main article, 13-†340-41  
     in history of American Literature, 13-346  
     portrait, 13-\*341  
**London, England**  
     aquarium, 3-†217-20  
     average rainfall and temperature, 6-108-B  
     becomes wealthiest city, 6-85  
     boat racing, 14-†531, 532, 533  
     bombings, debris left after, 6-\*514  
     carriages and coaches, 10-144  
     charter granted to, 6-\*19  
     coffee houses, 9-130; 13-173  
     early lighting, 10-390  
     financial center, 6-77  
     first waterworks, 10-537  
**London, England—continued**  
     Great Fire, 6-70, †71  
     Houses of Parliament, 6-\*78  
     in Roman times, 6-\*5  
     library of British Museum, 10-560  
     location, 6-108-B  
     longest day, 1-202  
     map, 6-573, F5  
     military guards, 6-\*84  
     overside port, 10-246  
     railway lines; route to France, map, 6-578  
     river travel in the past, 14-530  
     scenes and buildings, 6-\*84 fol.  
     theaters, 12-329, 331, 333; 7-405  
     trade, 10-253  
     water purified by sand filters, 10-542  
**London, Tower of**, *see* Tower of London  
**"London,"** by Samuel Johnson, 13-193  
**London Bridge**, 10-212, 213  
**London Bridge**, game, 14-172  
**London Company**, sends glassworkers to America, 12-36  
**London Independent Theatre**, 12-333  
**London Stone**, 10-376  
**London "Times,"** opinion of Bell's telephone, 10-112  
**Londonderry**, Northern Ireland, 6-\*162-A  
**Lone Dog**, Indian, keeps calendar for Dakota tribe, 10-\*479  
**Lone Star flag** of Texas, 8-380  
**Lone Star State**, 8-386-A  
**Long, Huey P.**, governor of Louisiana, 8-145  
**Long-billed curlew**, bird, 4-\*11  
**Long-billed marsh wren**, 4-101  
**Long Branch**, N. J., resort, 8-246  
**Long-distance telephone**, 10-112, 113  
**Long division**, mathematics, 10-430  
**Long-eared bat**, 4-274  
**Long-eared owl**, 4-166  
**Long-horned shrimp**, 3-188  
**Long houses**, Indian, 7-99; 8-269  
**Long Island**, N. Y., 8-268, 276, 283  
     duck farm, 8-\*276  
     early name, 8-284-A  
**Long Island, Battle of**, 7-167  
**"Long Island Farmhouse,"** painting by William S. Mount, 11-\*371  
**Long Lake Migratory Bird Refuge**, North Dakota, 8-302-A  
**Long measure**, 10-375  
**Long-nosed crocodile**, 3-441  
**Long-nosed garfish**, 3-240  
**Long-nosed monkey**, 4-256, 257  
**Long-nosed sturgeon**, 3-\*245  
**Long-nosed viper**, 3-\*490  
**Long Parliament**, England, leading to Civil War, 6-63, \*69; 12-407-9  
**"Long Strads,"** violins, 12-225  
**Long-tailed pangolin**, 4-456  
**Long-tailed shrew**, 4-280  
**Long-tailed tits**, birds, 4-†173  
**Long-tailed widow bird**, 4-182

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Long War** in Hungary, 6-282
- Longfellow, Henry Wadsworth, life and works**,  
main article, 13-†301-3, \*308  
and William Dean Howells, 13-331  
"Evangeline," 7-8  
"Hiawatha," quoted, 10-350; 14-509  
portrait, 13-\*302  
"The Skeleton in Armor," quoted, 7-112
- Longfellow House**, Cambridge, Mass., 11-504;  
13-\*301, 303
- Longhena, Baldassare**, 11-487
- Longhorn beetle**, 3-340
- Longitude** and time measurement, 10-†470-73
- Long's Peak, Colorado**, 7-\*408
- Longshoremen**, 10-249
- Longspurs**, birds, 4-\*128, 129, 130
- Longstreet, James**, portrait, 7-\*257
- Longworth, Alice Roosevelt** (Mrs. Nicholas Longworth), popularity, 12-564
- Lonsdale, William**, 3-21
- "**Look Homeward, Angel**," novel by Thomas Wolfe, 13-352
- "**Lookout—All's Well, The**," painting by Winslow Homer, color plate, 11-\*361
- Lookout, Cape, N. C.**, 8-296
- Lookout Mountain**, Tenn., 8-374, Georgia, 8-84
- Looming**, caused by mist, 1-†425
- Looms**, invention of, 10-342  
Indians', 10-†343  
rug manufacture, 12-\*151, †152, †159 fol.  
Swiss lake dwellers', 5-\*35  
tapestry weaving, 12-138
- Loon**, diving bird, 4-120, 122
- Looper** (inchworm), 3-293
- Lope de Vega Carpio**, *see* Vega Carpio, Lope Félix de
- Lopez, Francisco Solano**, 5-509
- Lophortyx californicus**, bird, 8-42-B
- Lorain County, Ohio**, quarries, 8-312
- Loran**, radar device, 10-†229
- Lord George Gordon riots**, England, 6-93
- "**Lord Jim**," by Joseph Conrad, 13-274
- "**Lord Kelvin**," cable ship, 10-\*105
- Lord of the Isles**, Scottish feudal title, 6-488
- "**Lord of the Isles, The**," by Scott, 6-114
- "**Lord of the Two Houses**," of Egypt, 5-51
- Lord Protector**, Cromwell's title, 6-70
- Lords**, feudal, 7-351
- Lords, House of**, 6-108-B  
beginning of, 6-25  
power curtailed, 6-102  
traditional use of a woolsack, 9-75  
*see also* Parliament, British
- Lords Marcher**, Welsh adventurers, 6-138
- Lords of the Congregation**, Scotland, 6-\*116, 121
- Loredano, Leonardo**, doge, portrait, 11-\*175
- Lorelei**, music of, 12-\*254
- Lorenzetti, Ambrogio**, Italian painter, 11-120
- Lorenzetti, Pietro**, Italian painter, 11-120
- Lorenzo de' Medici**, *see* Medici, Lorenzo de'
- Lorikeet**, bird, color plate, 4-\*184
- Loris**, monkey, 4-†267-69
- Lorrain, Claude** (Claude Gellée), 11-†234 fol.  
compared with Turner, 11-312  
contemporaries, 12-412  
paintings  
"Parnassus," 11-\*236  
"The Ancient Port of Ostia," 11-\*230  
"The Departure of Cleopatra," 11-\*238
- Lorraine**, prov., France  
added to France by Louis XIV, 6-219  
becomes part of Germany, 6-200, 216, 229, 231  
map, 6-579  
restored to France after World War I, 6-202, 238
- Lorry**, motor truck, 10-281
- Lory**, parrot, 4-192
- Los Angeles, Calif.**, 8-41  
branch of University of California, 8-41  
City Hall, 11-\*519  
name, 8-37  
water supply, 10-\*547, 549, 551  
"Los Angeles," dirigible, 7-†487
- Lo Spagnoletto** (José Ribera), painting by, art style, 11-\*247, 248  
"Isaac Blessing David," painting, 11-\*247
- Lost Continent**, 3-35; 5-444
- "**Lost Lady, A**," novel by Willa Cather, 13-352
- "**Lost Mind, The**," painting by Elhu Vedder, 11-\*371
- Lost River Range**, U. S., 8-92 A
- Lothair II**, the Saxon, Holy Roman emperor, 6-209
- Loti, Pierre** (Louis Marie Julien Vaud), author of "Ice-land Fisherman," 9-365
- Lotus**, flower, in architectural decoration, 11-413  
motif in jewelry, 12-122
- Lotus-eaters** (Lotophagi), 14-420  
in the "Odyssey," 13-29
- Lotus of the World** in Hindu philosophy, 5-366, 369
- Loudness and softness of sound**, 1-448, 449
- Loudspeaker**, radio, 10-†121-Q
- "**Louis**," etymology, 8-146-A
- Louis, Saint**, *see* Louis IX (St. Louis), king of France
- Louis I**, the Pious, Holy Roman emperor, 6-169, 246
- Louis II**, king of Bavaria, castle built by, 11-481
- Louis VI**, the Fat, king of France, 6-169, \*171
- Louis VII**, king of France, 6-169
- Louis VIII**, king of France, 6-170; 12-376
- Louis IX (St. Louis), king of France, life and crusades**, main article, 12-†376-78  
and Vincent de Beauvais, 6-\*169  
canonized, 12-378  
reign, 6-170; 12-378  
Sainte Chapelle built by, 11-465
- Louis XI**, king of France, 6-176
- Louis XII**, king of France, 6-176  
in Italy, 6-302
- Louis XIII**, king of France, 6-180

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



- Louis XIV (Sun King), king of France, life and reign, main article, 12-†410-13; 6-181, 182-85**  
 and Madame de Maintenon, 12-413  
 art and literature encouraged by, 13-\*114  
 art during reign, 6-184; †11-†231-33, \*237, †238-39  
 goldsmithing and silversmithing, 12-90  
 billiards made fashionable by, 14-477  
 court, 13-\*114  
 declares "I am the state," 7-354  
 flattered by Boileau, 13-114  
 fondness for enamel, 12-68  
 friendship with Molière, 13-111  
 grandson and family, costumes, 9-\*10  
 La Salle a cavalier of, 13-485  
 lace making encouraged by, 12-171  
 Leibnitz' effort to save Germany from, 13-14  
 Louisiana named for, 13-486  
 palace furnishings, 12-\*189, †190  
   bedroom at Versailles, 11-\*233  
 portrait, 12-\*411  
 statues, 12-\*413  
   by Girardon, 11-\*231  
 tapestry industry bought by, 12-144  
 titles, 12-486  
 Versailles built, 11-239, 490, 491; 12-411  
 wars, 6-75, 184, 219, 331, 12-†411 fol.  
**Louis XV, king of France, 6-185; 7-354**  
 palace furnishings and decoration, 11-282;  
   12-\*189, 190  
   bedroom, 11-\*282  
 portrait, 6-\*184  
**Louis XVI, king of France, 6-†186-93**  
 aids American colonies, 6-188  
 Benjamin Franklin at court of, 12-\*465, 468  
 execution, 6-193  
 inadequacy, 7-354  
 kindness, 6-\*185  
 palace furnishings, 12-\*189, 190  
 pastoral life at Versailles, 9-79  
**Louis XVII, Charles, titular king of France,**  
 portrait, 6-\*197  
**Louis XVIII, king of France, 6-197**  
**Louis I, the Great, king of Hungary, 6-280**  
 rule in Poland, 6-447  
**Louis, the German, king of the East Franks,**  
 6-207  
**Louis Philippe, king of France, reign, 6-†198-99**  
**Louis Napoleon, see Napoleon III, emperor of France**  
**Louis, duke of Anjou, patron of art, 11-103**  
**Louis de Bourbon, see Condé the Great, Louis II de Bourbon, prince of**  
**Louis Quatorze furniture, 12-\*189, †190**  
**Louis Quatorze style of decoration, 12-412**  
**Louis Quinze furniture, 12-\*189, 190**  
**Louis Seize furniture, 12-\*189, 190**  
**Louisburg, Nova Scotia, fortress, capture and return of, 7-8**  
**Louise, queen of Prussia, 6-\*222, \*224**  
 received by Napoleon, 12-\*428
- Louisiana, state, U. S., description and history, main article, 8-†140-45; general data, 8-146-146-B**  
 agriculture, 8-142  
 area, 8-146  
 capital and capitol building, 8-\*140  
 charities and correction, list, 8-146  
 cities, towns, list, 8-145, 146-B  
 climate, 8-146  
 constitutions, 8-146-A  
 counties, list, 8-146-B  
 Creoles, 8-142  
 education, 8-144  
   institutions of higher learning, list, 8-146  
 flag, 8-146-A  
 history, 8-141  
   admitted to Union, 8-142; 7-213, 218  
 holidays, 8-146-A  
 Indians, 8-141  
   reservation, 8-146-A  
 location, 8-146  
 map, 8-501  
   on United States map, 7-595  
 motto, 8-146-A  
 name, 8-146-A  
 Negroes and slavery, 8-143, 144  
 nickname, 8-146-A  
 physical features, 8-140, 146  
 political facts, 8-146-A  
 products and industries, 8-143-45  
 reservations, game and bird, 8-146-A; 4-517  
 rivers, 8-146  
 salt beds, 9-411, 413  
 state bird, 8-146-A  
 state flower, 8-146-A  
 state song, 8-146-A  
 transportation, 8-140, 144  
**Louisiana and Texas Intracoastal Waterway,**  
 8-146  
**Louisiana Purchase, 7-204-7; 6-332**  
 attempts to colonize, 7-139  
 Lewis and Clark expedition, 13-†491-92; 7-220  
 map, 7-\*206  
 Napoleon acquires and sells, 6-332  
 provision for free and slave states, 7-218  
 slavery, 8-209  
 Spanish control, 8-142  
 won by La Salle for France, 13-486  
**Louisiana State University, 8-142**  
 Smith Hall, 8-\*142  
**Louisiana terrapins, 8-145**  
**"Louisiana Tigers," 8-143**  
**Louisiana water thrush, 4-†47**  
**Louisville, Ky., 8-\*137**  
 Confederate Monument, 8-\*136  
 flood, 8-138  
 manufactures, 8-138  
 temperature, 8-138-A  
**Louisville and Portland Canal, 8-138-A**  
**Louisville rapids, 8-137**  
**Lounge of steamship, 10-300, \*301**  
**Loup River, U. S., 8-228**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Louvre**, palace, Paris  
 building of the palace, 11-488  
 Poussin called to decorate, 11-236  
**"Love Affairs of a Bibliomaniac,"** by Eugene Field, 13-344  
**Love birds** (budgerigars), 4-192  
**"Love for Love,"** comedy by William Congreve, 12-331  
**Lovell, Robert**, 13-219  
**Loveman, Robert**, poem written by, 8-84-A  
**Low, Juliette, Mrs.**, 14-546  
**Low, Seth**, library presented to Columbia by, 10-559  
**Low, Will H.**, painting by, 7-\*526  
**Low**, in meteorology, 1-228, 261, 277, †278-B  
**Low Memorial Library**, Columbia University, 10-\*559  
**"Low Tide on Grand Pré,"** by Bliss Carman, 13-579  
**Lowboy**, chest of drawers, 12-\*195, 198  
**Lowell, Amy**, poet, 13-349  
 poet of Revival, 13-348  
 portrait, 13-\*350  
**Lowell, James Russell**, life and works, main article, 13-†311-13  
 home at Cambridge, Mass., 13-\*312  
 opinion of Mexican War, 7-239  
 pictured in notable gathering, 13-\*308  
 portrait, 13-\*312  
 quoted on Asa Gray, 13-412  
**Lowell, Maria White** (Mrs. James Russell Lowell), 13-313  
**Lowell, Percival**, life and astronomical research, main article, 13-406-8  
 belief in canals on Mars, 1-151  
 portrait, 13-\*407  
 prediction about the planet Pluto, 1-159  
**Lowell, Mass.**, industries, 8-172  
**Lowell, Vt.**, asbestos, 8-403  
**Lowell Observatory**, Flagstaff, Ariz., 1-159, 183; 13-407  
**Lower California**, terr., Mexico, map, 7-596  
**Lower Canada**, province, Canada, history, 7-14, 15-18  
**Lower Carboniferous period**, 3-27  
**Lower case**, printing, 10-58  
**Lower (Northern) Kingdom**, Egypt, 5-51  
**Lower Paleolithic period**, 5-27  
**Lowlanders**, Scottish, 6-124, 129  
**Lowlands**, plain in Scotland, 6-108-B  
**Lowrey, Perrin H.**, composer, 8-206-A  
**Loyalists**, in American colonies  
 migration to Canada, 7-13  
 New York, 8-277  
 North Carolina, 8-290, 291  
 treatment of, 7-168  
**Loyola, Ignatius de, Saint**, life, main article, 13-†545-46  
 founds Jesuit order, 6-302  
**LST**, amphibious boat, 10-\*348  
**Lualaba**, river, Africa, massacre, 13-554  
**Lubang Islands**, Philippines, map, 5-594  
**Lube oil header**, Diesel engine, 10-\*291  
**Lubec**, Maine, factories, 8-154  
**Lubricants**, chemical analysis, 10-548  
**Lubricating oil**, *see* Oil  
**Luca della Robbia**, *see* Robbia, Luca della  
**Lucan**, Sir, in Arthurian romances, 14-403  
**Lucas, Mr.**, working upon Egyptian casket, 5-\*10  
**Lucerne**, Switzerland, joins Swiss Confederation; war with Austria, 6-248  
**Lucerne, Lake of**, Switzerland, 6-\*243  
**"Lucerne, Lion of,"** sculpture by Thorvaldsen, 6-\*250  
**"Lucia di Lammermoor,"** opera by Donizetti, 12-253  
 sextette from, 12-253  
**Lucian**, Greek writer, 5-544  
**"Luck of Roaring Camp, The,"** by Bret Harte, 13-334  
**Lucknow**, India, Sepoy Rebellion, 5-384  
**Lucretius (Titus Lucretius Carus)**, Roman poet, 13-3  
 quotation from, 8-262-A  
**Lucy, Sir Thomas**, Shakespeare brought before, 13-\*155  
**Ludovico (il Moro)**, *see* Milan, Ludovico (il Moro), duke of  
**Ludovisi relief**, Greek carving, 11-†41-42  
**"Ludwig,"** name, etymology same as "Louis," 8-146-A  
**Ludwig**, king of Bavaria  
 carriage, 10-\*145  
 gives Wagner commission, 12-295  
**Ludwig Canal**, Germany, 10-259  
**Lugal-Zagizzi**, king of Sumeria, 5-80  
**Luidia starfish**, 3-†133  
**Luke, Saint**  
 depicted in painting, 11-\*198; symbol, 11-77  
**Lukiko**, ruling body in Uganda, 5-462  
**"Lullaby,"** by Brahms, 12-246  
**Lulli, Giovanni Battista**, music of, 12-227  
**Lumbar nerves**, anatomy, 2-\*393  
**Lumber and lumbering**, main article, 9-†245-58  
 camps, 9-†246-53; color plate, 7-\*29-J  
 chemical industries utilize, 10-547  
 driving logs down stream, 9-\*249, †251  
 hard and soft woods, definition and uses, 9-257  
 lumber producing areas, 9-257-58  
 British Honduras, 7-45  
 Canada, 7-\*16, \*28  
 United States, 9-246, 257; 7-118-D; 8-153  
 Alabama's Timber Belt, 8-4  
 Arkansas, 8-30  
 Idaho, 8-92  
 Louisiana, 8-145  
 Michigan, 8-184  
 Mississippi, 8-205  
 Oregon, 8-329  
 Wisconsin, 8-443  
 reforestation to keep up supply of timber, 2-†240-47; *see also* Reforestation  
 waste material, 9-†294

The asterisk (\*) refers to picture and its explanation only. The onelisk (†) refers to illustrated text.

- Lumber rattlesnake**, 3-<sup>\*</sup>491  
**Lumber State**, nickname for Maine, 8-156-A  
**Lumen**, measure of light, 10-393  
**Lumière brothers**, Auguste and Louis, develop moving-picture apparatus, 10-503  
**Luminescence**  
   bacteria, 2-18  
   centipedes, 3-265  
   fireflies, 10-393  
   fungi, 2-<sup>\*</sup>72  
   "living fireworks," 3-112  
   sea creatures, 3-80  
     fishes, 3-<sup>\*</sup>194, 208  
     jelly fish, 3-107, 111, 114  
     sea worms, 3-124, 125  
     shrimps and prawns, 3-188  
     starfish, 3-135  
   *see also* Phosphorescence  
**Lumpfish**, 3-214  
**Lumpkin, Grace**, novelist, 13-355  
**Lunar month**, 1-123, 124  
**"Lunatic,"** origin of word, 1-122  
**Lund, Sweden**, Cathedral clock, 10-<sup>\*</sup>465  
**Lüneberg, Battle of**, 6-225  
**Lunenburg, Nova Scotia**, fishing port, 7-29-M  
**Lunéville, Treaty of**, 6-194  
**Lungfish**, 3-<sup>\*</sup>218  
   in Devonian period, 3-24  
**Lungs, structure; function**, main article, 2-  
   †333-42, <sup>\*</sup>352  
   area of lung surface, 2-334  
   blood aerated in, 2-374  
   cause of tuberculosis in, 2-347  
   color plates, 2-frontispiece, <sup>\*</sup>278, <sup>\*</sup>279  
   contact of blood with cells, 2-346  
   exhaust organ, 2-367  
   protected by nose and other passages, 2-336  
   protected by ribs, color plate, 2-<sup>\*</sup>278  
**Luray Caverns**, limestone formations, 8-418  
**Luren**, horn, 12-<sup>\*</sup>208; 6-<sup>\*</sup>405  
**"Lusiads, The,"** by Camoëns, 13-81  
**"Lusitania,"** ship, torpedoed, 7-320; 12-551  
**Lusterware**, pottery, 12-56  
**Lute**, musical instrument, 12-258-D, <sup>\*</sup>213, <sup>\*</sup>221, <sup>\*</sup>229  
   Egyptian, 12-203  
   played by Martin Luther, 12-<sup>\*</sup>216  
**"Lute Player,"** paintings  
   by Caravaggio, 11-<sup>\*</sup>185  
   by Carpaccio, 12-<sup>\*</sup>229  
   by Meissonier, 12-215  
**Lutetium**, element, symbol, atomic no. and wt., 1-<sup>\*</sup>551  
**Luther, Martin, life and work**, main article, 13-†541-44  
   as a musician, 12-217  
   attitude toward Jews, 5-137  
   Erasmus' attitude toward, 13-83  
   portrait by Cranach, 11-<sup>\*</sup>211  
   refusing to take back heresies, 5-<sup>\*</sup>284  
   starts Reformation, 13-†543-44; 6-212  
**Lutheranism**  
   Germany, 6-213  
   Scandinavian countries, 6-388, 398, 400, 420  
**Lutherans**, Pennsylvania settled by, 8-335  
**Lutuamian Indians**, in Oregon, 8-328  
**Luxembourg**, grand duchy, 6-469; general data, 6-355-A; *see also* index World War II, 6-493  
   added to Austrian domains, 6-260  
   area, 6-355-A  
   flag, color plate, 14-following 570, no. 44  
   government, 6-355-A  
   language spoken, 6-355-A  
   location, 6-355-A  
   map, 6-593  
   people, 6-355-A  
   physical features, 6-355-A  
**Luxembourg**, city, Luxembourg, location by Lat. and Long., 6-355-A  
**Luxembourg**, palace, Paris, Rubens' paintings, 11-<sup>\*</sup>221, 224, 281  
**Luxor**, Egypt, statue of Rameses II, 5-<sup>\*</sup>68  
**Luzon**, island, Philippines  
   area, 5-570  
   Malay civilization, 5-563, <sup>\*</sup>566  
   map, 5-594  
**Lyceum**, school, Athens, 5-171  
   founded by Aristotle, 13-9  
**"Lycidas,"** by John Milton, 13-166, 168  
**Lycopodium powder**, 2-92  
**Lycopodiums**, fern allies, 2-<sup>\*</sup>91, 92  
**Lycosa** (wolf spider), 3-<sup>\*</sup>406, <sup>\*</sup>412  
**Lycurgus**, Spartan lawgiver, 5-153, 155  
**Lydda**, Palestine, Church of St. George, 13-524  
**Lyddite**, explosive, 9-446  
**Lydia**, ancient country, Asia  
   conquest of, 5-102  
   map, 5-<sup>\*</sup>88  
**Lydian mode**, music, 12-208, 215  
**Lydians**, ancient people, 5-404  
   coinage invented by, 7-502  
**Lydo**, mythical inventor of chess, 14-488  
**Lyell, Sir Charles, life and work**, main article, 13-†429-31  
   portrait, 13-<sup>\*</sup>429  
**Lyell, Mary Horner** (Mrs. Charles Lyell), 13-431  
***Lygodium palmatum*** (climbing fern), 2-<sup>\*</sup>91  
**"Lying Lover, The,"** by Richard Steele, 13-180  
**Lymph**, body fluid, 2-346  
   entry into blood, 2-347  
   fight against tuberculosis, 2-†347  
   pericardium filled with, 2-370  
**Lymph nodes**, 2-†347  
**Lymphatic system** of body, 2-346, †347  
**Lymphocytes** of blood, 2-349  
**Lynch, James** (Leonid Andreyev), 13-97  
**Lynch Creek**, South Carolina, 8-356  
**Lynchburg**, Va., manufactures, 8-417  
**Lynette**, in Arthurian romances, 14-388  
**Lynn, Mass.**, shoe manufacture, 9-59  
**Lynn Canal**, channel, Alaska, 8-16  
**Lynx**, forest cat, 4-†295  
**Lyon, Matthew**, 7-199

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Lyonors, Lady**, and Gareth, in Arthurian romances, 14-388  
**Lyons, Joseph Aloysius**, Australian premier, 5-560-C  
**Lyons, France**  
 industries, 10-255  
 map, 6-581, J3  
 silk manufacture, 7-578; 9-38  
**Lyra** (Lyre), constellation, star maps showing:  
 July and August, 1-178-G, 178-H  
 May and June, 1-178-E  
 Nov. and Dec., 1-178-K  
 Sept. and Oct., 1-178-I, 178-J  
**Lyre**, decoration, 12-\*197  
**Lyre**, musical instrument, 12-\*205, †206, \*212, \*226  
 first, 14-409  
 in Greek mythology, 14-432

**Lyre**, musical instrument--*continued*  
 of Apollo, 5-\*158; 14-460  
 similar African instrument, 12-\*223  
**Lyre bird**, 4-†186-87  
**Lyric**, origin of name, 5-159  
**"Lyrical Ballads,"** by Coleridge and Wordsworth, 13-215, 218  
**Lyricists**, contemporary American, 13-352  
**"Lyrics of Earth,"** by Lampman, 13-577  
**Lysander**, Spartan commander, 5-173  
**Lysicrates**, monument by, 11-425  
**Lysins** in blood, 2-350  
**Lysippus**, Greek sculptor, works, 11-53, †54-55  
 Farnese Hercules a copy of statue by, 11-\*66  
 portraits of Alexander the Great, 12-349  
**"Lysistrata,"** by Aristophanes, 13-39  
**"Lyttel Boy, The,"** by Eugene Field, 13-343



**Maas (Meuse) River**, Europe, 6-352  
**"Mabinogion,"** Welsh stories, 6-138  
**Mabuse**, Jan, painting by, 11-\*201  
**Mac**, meaning of, in Scottish names, 6-111  
**McAdam, John Loudon**, 10-152  
**Macadamized roads**, 10-152, 156  
**"Macadamizing,"** origin of term, 10-20  
**McAdoo, William G.**, portrait, 12-\*549  
**MacAlpine, Kenneth**, Scottish chief, 6-111  
**Macao**, seaport, China, 5-336-D  
**Macaques**, monkeys, 4-\*254, †257-58  
**MacArthur, Arthur**, general, 12-555-H fol.  
**MacArthur, Arthur**, lawyer, 12-555-H  
**MacArthur, Douglas**, general, life, 12-†555-H-555-J; portraits, 6-\*527; 12-\*555-H  
 rôle in World War II, 5-560-C; 6-531, 533, 541, 551, 555; 12-555-G, 555-J  
**MacArthur, John**, 5-550  
**MacArthur, Mary Pinkney Hardy** (Mrs. Arthur MacArthur), 12-555-H  
**Macassar**, city of Celebes, covered chair used in, 5-\*427  
**Macaulay, Thomas Babington**, life and works,  
 main article, 13-†234-35  
 opinion of "Clarissa," 13-187  
 portrait, 13-\*234  
 quoted, 12-341  
**Macaws**, birds, 4-190  
 color plate, 4-\*185  
**Macbeth**, king of Scotland, 6-111; 6-488  
**"Macbeth,"** drama by Shakespeare, 13-158  
 Macbeth played by Burbage, 12-330  
 quotation from, 13-161  
**"Macbeth,"** symphonic poem by Richard Strauss, 12-316  
**Maccabees**, the, revolution against Syria, 5-129  
**McCarthy, Cormac**, and Blarney Stone, 6-145  
**McClellan, George Brinton**, in Civil War, 7-260, 262, 265

**McClellan, George Brinton--continued**  
 in Mexican War, 12-536  
 photograph, 7-258  
**McComb**, builds New York City Hall, 11-511  
**McCormick, Cyrus Hall**  
 makes first reaping machine, 10-\*411, †412, 413  
 portrait, 10-\*412  
**McCormick reapers and threshers**, 7-280  
**MacDonald, Alexander**, 6-129  
**Macdonald, Ballard**, song by, 8-312-B  
**McDonald, Flora**, 8-290  
**McDonald, Harl**, composer, 12-257  
**McDonald, James Ramsay**, British premier, 6-108; 7-\*341-A; 12-449-C  
**Macdonald, Sir John Alexander**, Canadian statesman, biography, 13-†569-70; 7 20, 23, 25, 27, 29-C  
**MacDonald, Ronald**, aids Prince Charlie, 6-125  
**Macdonough, Thomas**, victory on Lake Champlain, 7-211  
**MacDowell, Edward**, life, main article, 12-321-22, 257; portrait, 12-\*257, \*321  
**MacDowell, Marion Nevins** (Mrs. Edward MacDowell), 12-322  
**MacDowell Colony**, Peterboro, N. H., 12-321; 8-242  
**Macduff**, Scottish thane, burial place, 6-488  
**Mace**, spice, 9-208  
**Macedonia**, description and history, 5-177-80  
 conquest of known world, 5-177-79  
 division of empire, 5-180  
 subjection to Rome, 5-217  
 wars of Alexander the Great, 12-†347-49  
**Macedonian phalanx**, 5-178  
**McElroy, Mary**, hostess in White House, 12-563  
**"McFlecknoe,"** by John Dryden, 13-174  
**MacGregor, A. L.**, "Minnesota" by, 8-198-A

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**MacGregor, James Howard**, restorations of prehistoric man, 5-\*24, \*25, \*27

**Mach number**, in aeronautics, 10-328-S

**McHenry, Fort**, Baltimore, Md.

bombardment, 14-573

park, 8-162-A

statue of Francis Scott Key, 7-\*413, 414

**Machias, Maine**, in Revolutionary War, 8-152

**Machiavelli, Niccolò di Bernardo**, main article, 13-†69-70; 6-302

portrait, 13-\*70

**Machine Age**, 6-84

labor troubles result of, 7-550

war equipment a result of, 6-104

**Machine gun**, Reising, 10-\*368, 368-E

**Machinery**

adding and counting, 10-†420, 425

airplane engine, 10-\*322

automobile engine, 10-†282 91

before use of electricity, 1-\*505

bronzelike metals used for, 12-24

carboreundum machine, 9-\*382

carving, 12-107

chemistry's importance to, 10-549

clocks, 10-\*461, \*467

dynamo, 1-\*345 502, †506 8

economic importance, 7-500

effect on economic life, 7-545, 546

effect on human lives, 7-558

hydraulic press, 1-†368; 7-\*545

ice cutting machine, 10-\*515

in special industries

agriculture, 7-†452-53

corn, 8-\*105, †128, 9-\*105

harvesting machines, 10 †409-13; 9-\*100, 101, \*105

hay baling, 2 \*177

potato digging, 9-\*142

speeds settlement of wheat belt, 7-†280

threshing, 6-†361; 9-\*118

tractor and drill, 9-\*98

weed cleaner, 7-\*455

basket-weaving, 12-\*134

bread making, 9-241, \*242, 243

brick making, 9-376

butter making, 9 \*341, \*342

canning, 9-\*228, †230

cement making, 9-\*383

cheese making, 9-\*344

cigarette making, 9 \*224

coal mining, 9-\*437, †441, †443

copper mining, 9-\*417

cotton, 9-\*26, 30-31

cotton cultivator, 9-\*26

cotton gin, 10-†403 fol., †404-7; 9-\*30

cotton picker machine, 8-\*204; 9-\*26

fishing: "iron clink," 9-†368

flour making, 9-†233 fol.

fruit picking, 9-\*157

glass making, 12-36; 8-\*311

gold mining, 9 \*395

iron and steel, 9-\*404, \*406, \*407

**Machinery**, in special industries—*continued*

leather, 9-\*71

lumbering, 9-\*253, 254

marble, 9-\*381

match making, 10-\*335

milk, 9-\*336, \*337

newspaper, 10-\*82

nut, 9-\*202, \*203, \*204

oil, 9-452

oleomargarine, 9-\*372

paper making, 9-†277-80

potter's wheel, 12-†43

rayon, 1-\*554; 9-\*84, \*85, 86

refrigeration, 10-\*517, †518

rope making, 9-\*286, \*287

rubber, 9-\*260, 270

rug making, 12-\*159, \*160

salt production, 9-\*410

sewing machine, 10-†442-44

shoe making, 9-†61-63

sugar making, 9-†114, †116

sulfur drugs, 1-\*550

wool, 9-†80-81

incubator, 9-\*41, \*356

manufacturing centers, 7-343-F

mass production, 7-501, 566

"mince meat" machine, 7-\*505

money-making, 7-\*503

motor, 1-†527-28

oiling, 1-382; 10-549

opposition to, 10-277

perpetual-motion, attempts to create, 1-†315-18, 348

phonograph, *see* Phonograph

power drill, 5-\*557

principles of the simple machine, 1-†323-31

pulmotor, 2-338

pumps, 1-†464-65

quick-freezing, 10-519

road making, 10-\*154, \*155

safety regulations, 2-425

sheep shearing, motor driven shears, 5-\*551

spinning and weaving, 10-\*338, 344, \*345; 9-\*31, 86

standardization of products, 7-566, 574

steam engine, 10-†396 fol.

technological unemployment caused by, 7-545

transportation, 7-†500; *see also* Transportation

turbine, steam, 1-506, 507, 508; water, 1-370

typewriter, 10-†64

war, 10-†356 fol.

water wheel, 1-†70, \*505; 10-\*398

weighing, 10-\*374

windmill, 6-\*344, \*345, 352

work performed by, 1-†334 fol.

*see also* Engines; Inventions; Motors

**Macintosh, Charles**, invents raincoats, 9-268

**McGill University**, Canada, 7-29-R; 13-566, 579

**McIntyre, Samuel**, doorways by, 11-503, 505

**McIver, David**, 10-222

**McKay, Donald**, 10-223

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

- McKay, Gordon**, 9-61  
**McKay sewed shoe**, 9-61, \*62  
**Mackenzie, Alexander**, Canadian premier, 7-25  
**Mackenzie, Sir Alexander**, biography, 13-†562-64  
     explorations, 8-12  
**McKenzie, John**, New Zealand statesman, 5-540  
**McKenzie, Kenneth**, American fur trader, 8-217  
**Mackenzie, William Lyon**, leads rebellion in Canada, 7-17, 18  
**Mackenzie**, provisional dist., Canada, map, 7-592  
**MacKenzie Bay**, Canada, map, 7-592  
**MacKenzie River**, Canada, 7-\*29-W, 33-A  
     basin area, 10-257; map, 7-592; length, 10-253  
     discovery, 13-563  
**Mackerel**  
     catching and preparing for market, 9-366, \*367  
     destroyed by squids, 3-170  
     schools of: migration, 3-197  
**Mackerel sky**, 1-236, 266  
**McKim, Charles Follen**, 11-514  
     Low Memorial Library designed by, 10-559  
**Mackinac, Mich.**, mission, 8-181  
**McKinley, Ida Saxton** (Mrs. William McKinley), 12-564  
**McKinley, William**, president of the U. S., 12-456-D  
     Cuban problem; Spanish-American War, 7-294-97  
     ignores anti-trust laws, 7-308  
     nominated, 7-292  
     portrait, 7-\*298  
     reelected; assassinated, 7-302  
     scenes from political career, 7-\*295, \*302  
     Tariff Bill, 7-289, 302  
**McKinley, Mt.**, Alaska, 8-\*10; 7-407; 1-\*27  
     map, 7-590  
**McKinley Tariff Act**, 12-456-C  
**Mackintosh coats**, 9-268  
**McLean, Sir Donald**, rule in New Zealand, 5-539  
**MacLeish, Archibald**, poet, 13-354  
     poetic play, 13-355  
**MacLennan, Hugh**, Canadian author, 7-29-I  
**McLoughlin, John, Dr.**, English governor of Oregon, 8-326  
**MacMahon, Marie Edme Patrice Maurice de**, president of France, 6-200  
**Macmillan, Cyrus**, Canadian author, 7-29-I  
**MacMillan, Donald B.**, 13-\*502  
**MacMonnies, Frederick**, bronzes by, 11-\*376  
**MacMurrough, Dermot**, *see* Dermot MacMurrough, king of Leinster  
**McNary-Haugen Farm Bill**, 12-456-B  
**Macon, Ga.**, commerce, 8-83  
**Macquarie, Lachlan**, rule in New South Wales, 5-550, 551  
**McReynolds, James**, portrait, 12-\*549  
**Mad Anthony** (Anthony Wayne), 12-492  
**Mad Hatter**, character in "Alice in Wonderland," 13-\*266  
**Mad Mullah**, Somali chief, 5-458  
**Mad tom**, catfish, 3-242  
**Madagascar**, island, Indian Ocean, description, 5-464  
     animal life, 5-464  
     aye-ayes, 4-†269  
     birds  
         coucal, 4-\*180  
         fork-tailed drongo, 4-\*178  
         hoopoe, 4-\*180  
     lizards, 3-451, 462  
     lemurs, 4-†267 fol.  
     tenrecs, 4-\*457  
     area, 5-473-A  
     maps, 5-577  
     on map of World, 5-573  
     people and life in, 5-473-B, 445, \*458, \*459, 464  
**"Madam X,"** painting by Sargent, 11-\*363  
**"Madame Bovary,"** by Gustave Flaubert, 13-132  
**"Madame Butterfly,"** opera by Puccini, 12-253  
**Madame Ferdinand Jamin**, rose, 2-227  
**Madder plant**, dye from, 12-157  
**Madeira Islands**, No. Atlantic Ocean, description, 6-†490  
     map, 6-591  
     Portuguese colonization, 6-341  
     wild canary, 4-83  
**Madeira River**, Brazil, largest tributary of Amazon  
     length, 10-253  
     map, 5-602  
**Madeira wine**, 6-490  
**Madeleine church**, Paris, organ in, 12-258-D  
**Madero, Francisco**, Diaz overthrown by; murder of, 7-87  
**Madison, Dolly** (Mrs. James Madison), 12-560  
     gown worn by, 9-\*15  
     portrait, 12-\*561  
**Madison, James**, president of the U. S., 12-456-D; 7-202, 209-11  
     at Constitutional Convention, 12-\*496  
     co-author of "The Federalist," 12-509  
     Madison, Wisconsin, named after, 8-438  
     portrait, 7-\*194  
     public services, 7-194  
**Madison, Wis.**, 8-438  
     capitol building, 8-\*438  
     lakes, 8-446  
     University of Wisconsin, 8-\*440, 445  
**Madison, Fort**, Iowa, founded, 8-120  
**Madison River**, Montana, 8-220  
**"Madoc,"** by Robert Southey, 13-220  
**Madonna**, medieval worship of; influence upon art, 11-94  
**Madonna**, in art  
     and Three Wise Men, 5-\*101  
     Byzantine, 11-\*79, \*80  
     Flemish  
         Jan Mabuse, 11-\*201  
         van der Goes, 11-\*203

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Madonna, Flemish--continued**

van Eyck, 11-\*191, \*193

van der Weyden, 11-\*198

**German**

Durer, 11-\*208

early, "Garden of Paradise, The," 11-\*205

Stephen Lochner, 11-\*206

**Italian**

Andrea del Sarto, 11-\*165, \*166

Botticelli, 11-\*122, \*145

Fra Filippo Lippi, 11-\*134, 136

Gentile, 11-\*139

Giovanni Bellini, 11-†175, \*176

Guido Reni, 11-\*188

Jacopo Bellini, 11-\*173

Leonardo da Vinci, 11-\*150, 151

Luca della Robbia, 11-\*131

Luca Signorelli, 11-\*141

Mantegna, 11-139

Mino da Fiesole, 11-\*137

Raphael, 11-†167, 168, \*164; 12-141

Verrocchio, 11-\*142

Pre-Raphaelite conception, 11-\*317

**sculptures**

Gothic, 11-\*92, †94, \*95-96

Italian Renaissance, 11-\*110, \*137

Michelangelo's Pietà, 11-\*161

**Spanish, 11-\*242**

Murillo, 11-\*254, \*257, 258

"Madonna and Child with Angels," painting by Cimabue, 11-\*111, 113

"Madonna and Child with St. Anne," painting by Durer, 11-\*208

"Madonna and Child with Saints," by Giovanni Bellini, 11-\*175

"Madonna in the Rose Arbor," painting by Stephan Lochner, 11-\*206

"Madonna of Chancellor Rollin, The," painting by John Van Eyck, 11-\*191, 195

"Madonna of the Chair," painting by Raphael, 11-†167

"Madonna of the Harpies," painting by Andrea del Sarto, 11-\*165

"Madonna of the Rocks," painting by Leonardo da Vinci, 11-\*150, 151

**Madras, India, British center, 5-379, 381****Madrepore, coral, 3-100, \*101****Madrid, Spain**

capital, 13-77

location, 6-342-A

massacre by French troops, 11-\*306, 309

rainfall and temperature, 6-342-A

Second of May uprising, 6-†331

**Madrigals, songs, 12-220****Madura, island, Indonesia, 5-529-B****Maecenas, patron of poets, 13-48, 50****Maes, Nicholas, 11-\*260**

"The Jealous Husband," painting, 11-\*260

**Maestrovic, Ivan, sculptor, 11-392****Maeterlinck, Maurice, life; works, main article, 13-99-100; portrait, 13-\*100**

"The Intelligence of the Flowers," 2-189

**Mafeking, Cape Province, So. Africa, in Boer War, 5-487, 488****Magallanes, terr., Chile, plains of, 5-†514****Magazine Mountain, Ark., 8-27****Magazine rack, how to make, 14-†50****Magdalena River, Colombia, South America; rises in Andes; flows into Caribbean, 5-518-E length, 10-253 map, 5-602****Magdalene (Mary), the, painting by Quentin Massys, 11-\*200****Magdeburg, Germany, 10-257**

map, 6-582, D2

**Magdeburg Hemispheres, 1-\*452, 453****Magellan, Fernando, main article, 13-†462-63 explorations, 13-†462-63, 504; 7-116, 117**

discovers Guam, 8-465

first trip around world, 6-341

in Philippines, 5-564

portrait, 13-\*462

spice cargo, 9-209

**Magellan, Strait of, So. Amer., map, 5-604**

Francis Drake first to pass through, 5-501

**Magellan's upland goose, 4-\*122****Maggiore, Lake, Europe, map, 6-585****Maggot, housefly, 3-\*358****Magi, ancient Persian priests, 5-102****Magic**

American Indian, 7-96

Greek mythology, 14-443

origin of word, 5-102

tricks, 14-†123-28

**"Magic Flute, The," opera by Mozart, 12-237, 258-A**

written on clavichord, 12-258-D

**"Magic Mountain, The," novel by Mann, 13-289****Magic ring, the, game, 14-162****Maginot Line, French fortifications, 6-202, 504, 508, 511****Magna Charta, 6-24, \*28; 7-353**

clauses for Wales, 6-139

granted to barons by King John, 6-\*18, 24; 7-\*352, 353

**Magnes, shepherd, discovers magnet, 1-485****Magnesia, Battle of, 5-218****Magnesite, mineral, 9-422****Magnesium, element**

by-product of salt, 1-536

chemical behavior, 1-547

necessary for chlorophyll, 2-45

plant need of, 10-546

properties and uses, 1-535; 9-422

symbol, atomic no. and wt., 1-\*551

**Magnetic compass, 10-†455-57****Magnetic force, lines of, 1-\*502****Magnetic needle, 10-455****Magnetic poles, of earth, 1-488, 489, 491**

location: maps, 13-502-B; 10-†456

**Magnetic storms, 1-489; on sun, 1-115****Magnetite, iron ore, 1-486****Magnetometer, 9-\*451****Magnetron, vacuum tube, 1-†566**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Magnets and magnetism**, main article, 1-†485-91  
 destruction of magnets, 1-487  
 earth a magnet, 1-116, 488  
 Faraday first to induce electric current with, 1-503, 504  
 horseshoe magnet, 1-†487, 488  
 importance to modern civilization, 1-486  
 law of magnetism demonstrated, 1-†487  
 lines of magnetic force, 1-502  
 made by induction, 1-487  
 metals attracted by, 1-486  
 natural and artificial, 1-486  
 permanent and temporary, 1-486, 487  
 poles, 1-487, 488, 489, 491  
 sun a magnet, 1-116  
*see also* Electricity; Electromagnets; Physics
- "Magnificat,"** painting by Botticelli, 11-145
- Magnifying glasses**, 10-490; 12-27
- Magnitogorsk**, city, Russia, 6-440
- Magnitogorsk Dam**, 6-440
- Magnitude of stars**, 1-170
- Magnolia** (cucumber tree), 2-273, \*189  
 Louisiana's state flower, 8-146-A  
 Mississippi's state flower, 8-206-A  
 pollination, 2-189
- Magnolia State**, nickname for Mississippi, 8-206-A
- Magnus I**, the Good, king of Norway, 6-382
- Magnus the Law-Mender**, king of Norway, 6-386
- Magnus Barnlock**, king of Sweden, 6-395
- Magnus Eriksson**, king of Sweden and Norway, 6-386
- Magnus**, son of Harald, king of Norway, 6-382, 384
- Magnus**, nephew of King Birger, king of Sweden, 6-396
- Magot**, monkey, 4-258
- Magpie**, bird, 4-226
- Magrath, William**, 11-367  
 "The Old Sod," painting, 11-367
- Maguari stork**, 4-195
- Maguey**, Mexican century plant, 2-249
- Magyars**, Mongol people, 6-290-B  
 history of, in Hungary, 6-277-90, 258  
 repulsed by German emperors, 5-294; 6-207
- Mahabharata**, Indian epic, 5-368, 69
- Mahan Hall**, U. S. Naval Academy, 7-484
- Maharajahdhiraj**, title of ruler of Nepal, 5-441
- Mahatma Gandhi**, *see* Gandhi, Mohandas Karamchand
- Mahavira**, guiding spirit of Jainism, 5-369
- Mahdi**, the (Mohammed Ali), captures Khar-toum, 5-455
- Mahmud of Ghazni**, invades India, 5-373
- Mahogany**, wood, 9-258  
 cross section, 10-489  
 first seen in England, 13-480  
 furniture of, 12-194
- Mahomet**, *see* Mohammed
- Mahoning River**, U. S., 8-312-A
- Mahrattas**, people, of India, 5-367
- Maia**, goddess, 14-409  
 month of May named for, 14-583
- Maid Marian**, in story of Robin Hood, 14-356
- Maid of Orléans** (Joan of Arc), 12-385
- "Maid of Orleans, The,"** by Schiller, 13-270
- "Maid of Pskov, The,"** opera by Rimsky-Korsakov, 12-313
- Maidenhair fern**, 2-91
- "Maids of Honor,"** painting by Velasquez, 11-251, 255
- "Maid servant Pouring out Milk, A,"** painting by Vermeer, 11-269
- Maidu Indians**, in California, 8-36
- Mail, chain**, armor of, 10-352, \*354
- Mail cars**, railway, 10-84, 89
- Mail coaches**, 10-86, 87, †88, †89
- Mail-order house**, 7-538
- Mail robberies**, 10-87
- Mail service**, *see* Postal service
- Maillol, Aristide**, art style, 11-392  
 "Spring," sculpture, 11-389  
 "Summer," sculpture, 11-389  
 use of bronze, 12-24
- Maimonides, Moses**, 5-134
- Main River, Germany**, 10-257  
 map, 6-582
- Main royal**, sail, 10-171
- Main-royal staysail**, 10-171
- Main-royal studding sail**, 10-171
- Main skysail**, 10-171
- Main staysail**, 10-171
- Main-topgallant sail**, 10-171
- Main-topgallant staysail**, 10-171
- Main topgallant studding sail**, 10-171
- Main-topmast staysail**, 10-171
- Main-topmast studding sail**, 10-171
- Main topsails**, upper and lower, 10-171
- Mainsail**, 10-171
- "Main Street,"** by Sinclair Lewis, 13-350
- "Main-Traveled Roads,"** by Hamlin Garland, 13-346
- Maine**, state, U. S., description and history,  
 main article, 8-†148-55; general data, 8-156-156-B  
 area, 8-156  
 capital and capitol building, 8-148  
 charities and correction, 8-156  
 cities, towns, list, 8-156-A  
 climate, 8-156  
 coastline, 8-149  
 counties, list, 8-156-A  
 education, 8-155  
 institutions of higher learning, list, 8-156  
 flag, 8-156-A  
 history, 8-150-53  
 admitted to Union, 8-153; 7-218  
 holidays, 8-156-A  
 Indians, 8-150, 151  
 interesting facts, 8-156-A  
 location, 8-156  
 map 8-503  
 on United States map, 7-595

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Maine—continued**

- motto, 8-156-A
- name, 8-156-A
- nicknames, 8-156-A
- parks, 8-156-A; 7-409
- physical features, 8-156
- political facts, 8-156
- products and industries, 8-†153-55
  - fishing, 8-\*150, 151
  - fruit, 8-\*152
  - granite, 8-\*151
  - minerals, 8-154
  - potatoes, 9-\*142, \*145
  - timber, 8-153
- Red Paint People, 8-148-49, 150
- reforestation, 8-153
- reservations, game and bird, 8-156-A
- state bird, 8-156-A
- state flower, 8-156-A
- state song, 8-156-A
- water power from rivers, 8-153, 154
- "Maine," battleship, sinking of, 7-295, \*296
- Maine, University of**, 8-\*149
- Maintenon, Françoise d' Aubigné, Marquise de**, and Louis XIV., 12-413
- Mainz**, Germany, Rhine River port, 10-257
  - map, 6-584, C1
- Maio**, ancient race in China, 5-\*314
- Maipo, Battle of**, 5-505
- Maison Carrée**, at Nîmes, France, 11-†432
  - capitol of Virginia modelled after, 8-\*405
- Maitland, Lester J.**, aviator, portrait, 10-\*324
- Maitreya** deity, 5-347
- Maize**, *see* Corn
- Majlis**, Persian parliament, 5-106
- Majolica**, pottery, 12-56
- "Major Barbara," drama by George Bernard Shaw, 13-272
- Major scale**, music, 12-215
- Majorca**, island, Mediterranean Sea, 6-471
  - map, 6-591
- Majuba, Battle of**, 5-486
- Makassar Strait**, between Borneo and Celebes
  - map, 5-596
- Make-up** for moving pictures, 10-509
- Maksoud**, Persian rug maker, 12-154
- Malabar Coast**, India, Portuguese trading posts on, 5-378
- Malabar squirrel**, 4-\*367
- Malacca**, British settlement, part of Malaya, and Portuguese, 5-426, 430-B
  - map, 5-589
- Malacca, Strait of**, Asia, map, 5-589
- Malacca walking sticks**, 2-253
- Malad River**, U. S., 8-92-A
- Malan, Daniel F.**, South African premier, 5-491
- Malaprop, Mrs.**, in Sheridan play, 13-207
- Malapropism**, origin of term, 13-207
- Malaria**
  - bacteria of, 2-14
  - cure for, 9-217

**Malaria--continued**

- Panama, 10-270
- Malarial fever**, 3-\*362
- Malaspina glacier**, 8-16-A
- Malay Archipelago** (Malaysia), *see* East Indies
- Malay bear**, 4-318
- Malay Peninsula** (also called **Malaya** or **Malacca**), description, 5-†425-30
  - animal life, 5-425
  - birds
    - hornbill, 4-194
    - pheasants, 4-187, \*189
  - flying foxes, 4-275
  - flying squirrels, 4-369
  - gaur, 4-396
  - lizards, 3-448
  - tapirs, 4-\*348, 349
- British Malaya, 5-430-A-430-B
- climate, 5-425, 430-A
- location, 5-425, \*426, 430-A
- map, 5-589
- physical features, 5-425, 430-A
- political divisions, 5-†426-30
- products and industries, 5-430-A
  - canning, 9-228
  - gutta-percha produced in, 9-309
  - minerals, 5-430-B
  - teak, 9-258
  - tin, 5-426
- racial groups, 5-425, 427
- rivers, 5-430-A
- trade, 5-426
- Malay pigmies**, 5-\*28
- Malaya**, Asia, 5-426, 430-A
  - map, 5-589, 581
- Malayan tapir**, 4-\*348
- Malays**, people, 5-426, 430-B, 523
  - basket making, 12-131
  - characteristics, 5-336-C
- Madagascar**, 5-464
- pearl diving, 3-\*162 fol.
- Philippine Islands, 5-562, 563, 564
- sea rovers, 5-544
- Malcolm III**, king of Scotland, 6-111
- Malden**, Mass., shoe industry, 8-173
- Malheur Migratory Bird Refuge**, 8-332
- Malheur River**, Oregon, 8-331
- Malines** (Mechlin), lace, 12-\*165, \*169, 170
- Malis**, district of Greece, on map, 5-\*150
- Mallard**, wild duck, 4-119
  - color plate, 4-\*120
- Mallee**, plant, 5-560-J
- Malloch, Douglas**, song by, 8-186-B
- Mallow family**, cotton a member of, 9-28
- Malory, Sir Thomas**, life and work, 13-†145-46
  - Arthurian romances, 14-378, 382
- Malpighi, Marcello**
  - Harvey's theories proved by, 2-370
  - study of skin, 2-288
- Malplaquet**, France, British victory over French, 6-75
- Malt**, barley, 9-120

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Malta**, island, Mediterranean Sea, description, 6-476; *see also* index World War II, 6-493  
prehistoric ruins, 6-†475  
siege of, 5-\*282; 6-476
- Maltese cat**, 4-488
- Maltese Islands**, Mediterranean Sea, 6-476
- Mammals**  
bats, 4-†271-76  
bears, 4-†311-25  
characteristics, 3-†68  
cat family, 4-†284-96, †483-88  
cattle  
dairy, 9-†331-38  
wild, 4-†390-400, †415-30  
deer family, 4-†402 13, †415-30; 9-†74  
dog family, 4-†298-309, 490-503; 10-\*3  
dolphins and porpoises, 4-442, †445, 448  
egg-laying, 4-\*470, †471-72  
first appearance of, 3-43, †46, \*47, †49-57, 64  
giant hoofed creatures, 4-†337-52  
hog family, 4-†432-39  
horse tribe, 4-†349-52, †505-14  
marsupials (animals with pouches), 4-†459-72  
American, 4-\*468, 469-70  
Australian, 4-†459-72  
monkeys  
African and Asiatic, 4-†251-60, 267-69  
American, 4-†262-67  
apes, 4-†241-49  
number of species, 3-70  
prehistoric, 3-44, †47 fol.  
rodents, 4-†364-76, 378-88  
sea dwellers descended from land dwelling animals, 4-442  
seals, 4-†327-35  
temperature of blood, 2-15  
"toothless animals," 4-†450-57  
weasel family, 4-†354-62  
whales, 4-†441-48  
*see also classes of animals, as Marsupials, Rodents; also families of animals, as Cat family; Dog family; also names of animals, as Bears; Monkeys*
- Mammoth Cave**, Kentucky, 1-85, \*86  
blind fishes in, 3-257
- Mammoth Cave National Park**, Kentucky, 8-138-A
- Mammoth Paint Pots**, 7-\*408
- Mammoth Springs**, Ark., 8-27
- Mammoths**, prehistoric elephants  
fossil found in Siberia, 3-\*4, 5  
woolly mammoths 3-\*55; 4-344; 5-\*26
- Man**  
ability to learn, 2-397  
advancement due to brain, 10-128  
anatomy and physiology, *see* Volume 2; *see also* Anatomy; Physiology  
animals his friends, 4-516  
as burden carrier, 10-†129, 130, \*131, \*132;  
*see also* Transportation, man power  
brotherhood of, 13-12  
curiosity, 10-331
- Man—continued**  
dependence upon plant life, 2-41  
distinguished from other animals, 2-318, 319  
duty, 13-11, 12  
education, *see* Education; Schools  
evolution of skeleton, 2-319  
growth from primitive to modern life, 7-496 fol.  
happiness; according to Greek philosophers, 13-9-11  
ideal qualities; Socrates, 13-5  
ideas of right and wrong, 13-8  
imitation of nature's sounds, 12-201  
influence of climate on his civilization, 1-†193-96, 97  
justice; according to Aristotle, 13-10  
leisure; importance of, 13-10  
progress, 7-544  
purpose of life; Greek philosophers, 13-5 fol.  
races of, *see* Races of Man  
reflex actions, 2-393 fol.  
rights of, 7-368  
Rousseau's conception of, 13-19  
seeds used for food, 2-129  
source of wealth, 7-598  
the "Golden Mean" of living, Aristotle's doctrine, 13-10  
trade arising from needs, 7-571  
wisdom; Socrates, 13-5  
*see also* Man, prehistoric; Man, primitive; Civilization
- Man, prehistoric**, main article, 5-†23-40  
age of, on earth, 1-44  
art, 11-†1-4  
cave carvings, 12-95, \*106; 5-\*6, 7; 4-†510; 11-\*3, 4  
cave paintings, 5-27, 30; 6-317; 11-†1  
sculpture, 5-32  
cave dwellers, 5-\*23, 27, 28, 30  
in Spain and France, 6-317  
civilization, 5-†23-40; 11-2  
clothing, 5-24, 28, 30  
Cro-Magnon man, 5-†27, \*30, 39  
resemblance of Guanches to, 6-491; 10-379  
evolution of skull, 5-\*30  
fire making by, 10-\*333, 379, 387  
first appearance on earth, 3-57, 59, 64  
food, 5-23, 24, 28-29, 35 36  
Grimaldi race, 5-28  
in Ice Age, 3-64  
Java man, 5-\*25, \*30  
Neanderthal man, 5-\*23, †24, \*30, \*39  
New Mexico, 8-257  
physical characteristics, 5-†24, †25  
Pittdown man, 5-\*25, \*30; 3-57  
rule of the strong, 7-346  
Swiss lake dwellers, 5-†33 fol.; 6-244, \*245; 9-†46  
trade, 5-40  
use of torches, 10-388  
weapons and implements, 5-24 fol.  
*see also* Stone Age

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Man, primitive**

- basketry, 12-†129
- Canary Islands, natives, 6-491
- carvings, 12-†95-96, \*98
- \*costume, 9-†3-5, \*8, \*21; *see also* Indians, American, costume
- dwelling, 11-†395-400; 1-\*196
- fire and fire making, 10-\*330, †331-33
- fire worship, 10-334
- government, 7-†346
- methods of communication, 10-28-30
- mode of living, 7-†496-97
- modern tribes
  - African, 5-†443-73
  - Pacific Islanders, 5-†520-29
- musical instruments, 12-\*207
- obedience to law, 5-29, 32, 39
- picture writing, 10-†35-38
- Red Paint People, in Maine, 8-148-49, 150
- time reckoning, 10-†460, †475
- transportation
  - by land, 10-†128-34, †143, \*144, \*145
  - by water, 10-†136-40
- use of skins and leather, 9-\*67, \*68
- weapons, 10-†349-50
- weaving and spinning, 9-46
- see also* names of primitive peoples, as Eskimos; Indians; Negroes, African

**Man, races, *see* Races of man****Man, Isle of, Irish Sea, map, 6-572****"Man and Superman,"** by George Bernard Shaw, 13-271**Man-eater, shark, 3-\*199****Man-eating lion, 4-290****Man in the Moon, how found, 1-131, 139, \*143****"Man of Destiny, The,"** drama by George Bernard Shaw, 13-272**Man of Iron (Bismarck), 12-477****"Man of Thessaly,"** nursery rhyme, text, color plate, 14-174-D**Man-of-war, early British, 10-\*158, 165****Man-of-war (frigate) bird, 4-214, \*215****"Man who Died Twice, The,"** poem by Robinson, 13-349**"Man with a Blue Cap,"** painting by Paul Cézanne, 11-\*383**Man with Serpents, constellation, star maps showing:**

- July and August, 1-178-H

- May and June, 1-178-F

- Sept. and Oct., 1-178-J

**"Man with the Gloves, The,"** painting by Titian, 11-\*177, 178**Management, wages of, 7-537****Managua, Lake, Central America, 7-48 B****Manahata Indians, Manhattan purchased from, 8-272****Manakin, bird, 4-179****Manaos, Brazil, commerce, 10-241****Manatee, sea cow, 4-442****Manchester, England**

- In Roman times, 6-\*2

- industries, 10-254

- map, 6-572, D3

**Manchester, N. H., 8-240-41****Manchester, Ohio, established, 8-306****Manchester-Liverpool line, building of, 10-†185-87**

- Stephenson's locomotive wins prize on, 10-181

**Manchester Ship Canal, England, 10-274****Manchukuo, state, Asia, set up by Japan, 5-336****Manchuria, terr., China**

- animal life; tiger, 4-291

- maps, 5-591, 581

- soybean cultivation, 9-214

- war between China and Japan, 5-336

**Manchurian crane, decoration, 12-\*138****Manchurian eared pheasant, bird, 4-\*189****Manchus, people, rule in China, 5-330-34****Manco-Capac, Inca emperor, 5-495****Mandalay, India, rubies, 9-431****Mandan Indians, 8-359****Mandarin duck, 4-\*121****Mandarin square, tapestry, 12-\*138****Mandarin, citrus fruit, 9-173****Mandarinate, Chinese official class, 5-318, \*319, 320, 334****Mandolin, musical instrument, 12-258-D**

- sounding box, 1-449

**Mandrill, monkey, 4-†260****Manet, Édouard, art, 11-†340-42**

- "Execution of Maximilian," painting, 11-\*341

- recognition of; death, 11-344

- studies methods of Impressionists, 4-348

- "The Fife Player," painting, 11-\*340

**"Manfred,"** by Lord Byron, 12-227**Mangabeys, monkeys, 4-\*253, 254****Manganese**

- necessary to plants, 10-546; 2-45

- South America, 5-518-B

- symbol, atomic no. and wt., 1-\*551

- use, 9-403

**Mange, caused by mites, 3-413****Mangin, Joseph F., builds New York City Hall, 11-511****Mango, tropical fruit, 9-194****Mangosteen, tropical fruit, 9-196****Mangrove swamps, 3-27**

- roots, 2-\*37, 38

**Mangrove tree, 5-524**

- roots, 2-38

**Manhattan, Kansas, college at, 8-127****Manhattan Company Building, New York, 11-\*519****Manhattan Island, New York City**

- bought from Indians, 8-272; 7-\*131

- connection with New Jersey, 8-248

- Fort Amsterdam, 7-138

- rock foundation, 8-268

- see also* New York City

**Mani, Persian religious leader, 13-532****Manichaeism, religion, 13-532**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Manifest Destiny** and U. S. expansion, 7-234, 239
- Manila**, Philippine Islands  
 harbor, 10-\*245  
 history, 5-564, 565, 567, 569  
 on North Pacific route, 10-242  
 rainfall and temperature, 5-570  
 taken by Admiral Dewey, 12-541
- Manila Bay**, Philippine Islands, harbor, 5-570  
 American victory, 12-540; 7-296, \*297
- Manila hemp**, rope made from, 9-†282, 285-87;  
 7-\*572; manila paper made from, 9-\*180
- Manioc**, plant, 9-211, 239
- Manistee River**, Mich., 8-186-A
- Manitoba**, province, Canada, 7-29-T, 33-A, 33-B  
 climate, 7-33-A; map, 7-592  
 history, 7-24  
 national park, 7-29-V  
 prairies, 7-22
- Manizales**, Colombia, 9-\*131
- Manlius Vulso, Cnaeus**, in Punic Wars, 12-350
- Mann, Erika**, 13-288, 289
- Mann, Heinrich**, 13-288, 289
- Mann, Klaus**, 13-288, 289
- Mann, Thomas**, biography, 13-†288-89  
 portrait, 13-288
- Manna**, desert food, 9-214
- Manna**, lichen, 2-207
- Manning, Thomas**, Lamb's letters to, 13-224
- Manor**, medieval estate, 5-302; 9-240
- Manroot**, plant, 2-174
- "Man's Place in Nature,"** by Huxley, 13-438
- Mansart, Jules Hardouin**, French architect,  
 11-490; 12-412
- Mansdatter, Karin**, queen of Eric XIV of  
 Sweden, 6-\*399
- Mansfield, Mount**, Green Mts., Vt., 8-404
- "Mansfield Park,"** by Jane Austen, 13-208
- Manship, Paul**  
 classical influence, 11-392  
 use of bronze, 12-24
- Mansions**  
 colonial, 11-\*507, \*513-14; 7-\*151  
 Gothic, 11-476
- Mantegna, Andrea**, painting, 11-†138-40, 175,  
 184  
 and the Bellinis, 11-175  
 Crucifixions of Tintoretto and Mantegna com-  
 pared, 11-186  
 in Venice, 11-172  
 marriage, 11-140  
 "St. George," painting, 11-\*140  
 "St. Sebastian," painting, 11-\*140  
 style contrasted with Poussin, 11-235
- Mantel**, Adam style, 12-\*192
- Mantid** (mantis), insect, 3-349-51, \*355  
 shrimp named after, 3-188
- Mantis shrimp**, 3-†188
- Mantle**, gas, 10-†390
- Mantle of mollusk**, 3-142
- Mantle Rock**, 1-97
- Mantua, Duke of**, *see* Gonzaga, Vincenzo, duke  
 of Mantua
- "Manual of the Botany of the Northern United  
 States,"** by Asa Gray, 13-412
- Manual training**, *see* Contents Volume 14; *and*  
*also* Needlework; Things to make; Tools,  
 woodworking
- Manuals**, in music, 12-258-D
- Manufactures**  
 census of, 7-379  
 chemistry's contributions to, 10-544  
 Connecticut, 8-59  
 development in England, 6-84  
*see also* Industry, *and other names of industries*,  
*as* Paper; Shoes
- Manure**, in agriculture, 10-546; 2-19
- Manure spreaders**, farm machine, 1-\*537
- "Manuscript Found in a Bottle, The,"** by Edgar  
 Allan Poe, 13-315
- Manuscripts**  
 Anglo-Saxon Chronicle, 5-\*311  
 copied in monasteries, 5-308; 10-556  
 illuminated, 6-146; 10-48, 556  
 Irish, 11-†84  
 on parchment and vellum, 9-\*274
- Manutius, Aldus**, and his Aldine Press classics,  
 10-51
- Manville, N. J.**, asbestos products, 8-248
- Manx cat**, 4-487
- "Manyoshu,"** Japanese poems, 5-346
- Manzikert**, Asia Minor, battle at, 5-408
- Mao-tse tung**, Chinese Communist, 6-564
- Maoris**, people, in New Zealand, 5-†531-39  
 arts and crafts, 5-\*535, 541  
 boy, 1-\*200  
 cooking over steam hole, 1-\*35  
 village, 5-\*536  
 World War II, 5-541-A
- Map turtle**, 3-\*479
- Maple key**, fruit of maple, 2-275
- Maple sirup**, 9-124  
 cause of flavor, 2-237  
 obtained from cell sap, 2-9  
 Vermont's industry, 8-403, \*402
- Maple sugar**  
 how tree makes sugar, 2-†235-38  
 methods of sugaring, 9-†122-24  
 United States, 7-343-F  
 Vermont's industry, 8-403, \*402
- Maple tree**, 2-\*275  
 how sugar is made by, 2-†235-38  
 leaf pores, 2-52  
 seeds, 2-\*211  
 wood, 9-258
- Mapping land**, by photography, 10-452, 368
- Maps**  
 Afghanistan, 5-585  
 Africa  
 Central and Southern Africa, 5-577  
 Northern Africa, 5-574  
 political divisions, 5-\*444, 448  
 routes from Europe to Asia, 10-166

The asterisk (\*) refers to picture and its explanation only. The cheilisk (†) refers to illustrated text.

**Maps--continued**

- Alaska, 8-560
  - compared with U. S., 8-13
- Albania, 6-595
- Aleutian Islands, 8-560
- Alexander the Great's empire and line of march, 5-180
- America
  - European possessions in, before and after 1763, 7-139
  - Panama Canal, 10-268-B
- Antarctic regions, 13-502-B
- Arabia, 5-583
- Arctic regions, 13-502-A
- Asia, 5-580
- Assyrian empire, 5-88
- Australia, 5-600
- Austria, 6-587
- Aviation, global, 10-328-E
- Balkan Peninsula, 6-360
- Baltic Republics, 6-601
- Baluchistan, 5-585
- Belgium, 6-592
- Britain after Anglo-Saxon Conquest, 6-5
- British empire, 6-107
- British Isles, 13-502-A
- Bulgaria, 6-595
- Burma, 5-588
- Byzantine empire, 5-288
- Canada, Dominion of, 7-592
  - Arctic regions, 13-502-A
- Carthage and Rome during Punic Wars, 12-355
- Central America, 7-598
- Chaldean empire, 5-88
- China, 5-590
- cradle of civilization at head of Persian Gulf, 5-48, 76
- crusades, 5-296
- Cuba, 7-600
- Czechoslovakia, 6-587
- Denmark, 6-598
- dispersion of races of man, 5-†39
- distribution of peoples, 100 B.C., 6-165
- East Indies, 5-597
- Egypt, 5-578
  - ancient Egypt, 5-48, 88
- England, 6-572
  - and its language sources, 10-11
- Ethiopia, 5-578
- Europe, 6-571
  - in Middle Ages, 6-206
  - in time of Charlemagne, 5-265
- Fertile Crescent and surrounding region, 5-88
- Finland, 6-601
- France, 6-579, 580
- French Indo-China, 5-588
- Gatun Lake, Panama, 10-268-B
- Germany, 6-582
- glacial centers, 1-†61
- Greece, 6-595
  - ancient Greece, 5-150

**Maps--continued**

- Greenland, 13-502-A
- Gulf Stream, 1-223
- Hawaiian Islands, 8-562
- Hejaz, Arabia, 5-582
- Holy Land compared with Pennsylvania, 5-133
- Holy Roman Empire, 5-293
- Hungary, 6-587
- India, 5-587
- Ireland, 6-576
- Italy, 6-589
- Japan, 5-592
- Japan current, 1-223
- known world before Columbus' discoveries, 7-115
- Korea (Chosen), Asia, 5-591
- longitude and time measurement, 10-†472
- Louisiana Purchase, 7-206
- Luxembourg, grand duchy, Europe, 6-592
- Lydia, kingdom of, 5-88
- Malay Archipelago, 5-597
- Malay Peninsula and Sumatra, 5-596
- Median kingdom, 5-88
- meteorological
  - rainfall, 1-255
  - seasons, 1-208, 210
  - snowfall, 1-256
  - U. S. weather maps, 1-276, 277
  - winds, 1-224
- Mexico, 7-596
- Netherlands, 6-592
- New Zealand, 5-598
- North America, 7-591
  - during Ice Age, 1-61
- Norway, 6-596
- Palestine, 5-582, 118
- Panama, Isthmus of, 7-591
- Panama Canal, 10-268-B, 273; 7-591
- Persia, 5-585
- Persian empire under Darius, 5-100
- Philippine Islands, 5-594, 597, 581
- Phoenicia, 5-112
- photographs used in map making, 10-452
- Poland, 6-604
- polar regions
  - showing location of magnetic pole, 10-456
  - showing routes to the North Pole, 13-500
- Portugal, 6-591
- prehistoric topography different from present, 3-56
- Ptolemaic map of universe, 1-101
- rainfall, 1-†255
- Roman Empire, 5-246
  - during Punic Wars, 12-355
- Roumania, 6-595
- Russia, 6-601
  - Arctic regions, 13-502-A
  - Asiatic, 6-602
  - showing territory acquired from 1462 to date, 6-424
- Schleswig-Holstein, 6-599
- Scotland, 6-575

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Maps—continued**

- Siam, 5-588  
 Smith's (Captain John) explorations and maps, 12-460  
 solar system, 1-106, 150  
 South America, 5-603, 605  
 Spain, 6-591  
 star, 1-178-A-178-L  
 state maps, *see* Contents Volume 8  
 Straits Settlements, Asia, 5-588  
 Sumeria, 5-76  
 Sweden, 6-596  
 Switzerland, 6-584  
 Syria, 5-582  
 time map, 10-472  
 Turkey, 6-595  
   in Asia, 5-582  
 United States, 7-595  
   growth of territory, 7-206  
   *see also* state maps listed in Contents Volume 8  
 U.S.S.R., 6-601, 602  
 Wales, 6-572  
 West Indies, 7-601  
 Western Europe in 100 B.C., 6-165  
 World, showing countries and their colonies, 5-573  
 Yugoslavia, 6-587  
**Mar, John Erskine**, Earl of, Jacobite rebellion engineered by, 6-130  
**Marabou**, bird, 4-\*193  
**Maracaibo**, Venezuela, temperature, 5-518-F  
**Maracas**, falls, Trinidad, 7-66  
**Marañón River**, Peru, upper course of Amazon map, 5-602  
   source, 5-518-D  
**Maranos**, converted Jews, 5-137  
**Marat, Jean Paul**, murder of, 6-192  
**Maratha**, Hindu race, power, 5-379, 382  
**Marathon Battle of**, 5-162; 12-338  
**Marathon race**, 14-472, †474  
**Marble, Alice**, tennis player, 14-470  
**Marble**  
   African, in Roman mosaics, 12-111  
   Carrara, Italy, 9-380  
   limestone converted into, 1-51  
   quarrying, 8-\*5, \*48; 9-\*381  
   relation between limestone and, 1-52  
   Roman architecture; use in, 11-429  
   where found in United States, 9-380; 8-402  
   Tennessee's production, 8-371  
   Vermont, 8-401, 402  
**"Marble Faun, The,"** by Hawthorne, 13-301  
**Marbling**, of books, 10-\*63  
**Marcel, Etienne**, leads revolt in Paris, 6-172  
**Marcellus II**, pope, Palestrina's Mass of, 12-260  
**Marcellus**, nephew of Augustus Caesar, 13-48  
**March**, month, origin of name, 10-482  
**March Hare**, character in "Alice in Wonderland," 13-\*266  
**March River**, *see* Morava River

- Marchand**, French organist, challenged by Bach 12-262  
**Marco Polo** (Marco Millions), *see* Polo, Marco  
**"Marco Polo's sheep,"** 4-\*425, 426  
**Marconi, Guglielmo**, inventor of wireless telegraph, 10-115, 116  
   portrait, 10-\*116  
**Marconi system** of wireless telegraphy, 10-115  
**Marcos de Niza**, friar, 8-21, 257  
**Marcus Aurelius Antoninus**, Roman emperor, life, main article, 13-57  
   coin portraits, 11-67  
   Column, 11-\*434  
   equestrian statue, 11-\*67, 69  
   Galen made court physician by, 13-359  
   "Meditations," 5-242; 13-57  
   portrait bust, 13-\*57  
   reign, 5-242  
**Marcy, Mount**, in New York state, elevation, 8-264  
**Mardi Gras**, at New Orleans, 8-145  
**Mardonius**, Persian general, 5-162, 164  
**Marduk**, god, temple of, 5-5  
**Marengo, Battle of**, 12-428  
**Mare's tail**, cloud formation, 1-1247  
**Margaret, Saint**, queen of Scotland, 6-111  
**Margaret**, Scandinavian queen, reign, 6-411  
   Union of Kalmar, 6-396  
**Margaret**, daughter of Henry VII of England, marriages, 6-119, 120  
**Margaret**, duchess of Parma, in the Netherlands, 6-\*350  
**Margaret**, in Goethe's "Faust," 13-\*282  
**Margaret**, Maid of Norway, 6-113  
**"Margaret Ogilvy,"** by Sir James Barrie, 13-268  
**Magareta**, princess of Spain, portrait by Velasquez, 11-\*251, 255, 257  
**Margarine**, butter substitute, main article, 9-†372-73  
**Margarita**, island, Caribbean Sea, 5-518-E  
   magnesite from, 5-518-B  
**Marguerite** (daisy), 2-\*174  
**"Maria Chappelaine,"** by Louis Hémon, 7-29-I  
**Maria Cristina**, *see* Cristina, queen regent of Spain  
**Maria Theresa**, empress of Austria, reign, 6-264  
   and Hungary, 6-284  
   before Hungarian Diet, 6-\*256  
   builds Schönbrunn, 6-263  
   Mozart playing before, 12-\*266  
**Marianas (Ladrones) Islands**, Pacific, map, 5-597  
   inhabitants, 5-521  
   ownership, 5-522  
   Guam owned by U. S., 8-464  
   visited and named by Magellan, 13-463  
**Marias River**, Montana, 8-220  
**Marib, Arabia, dam**, 5-395  
**Marie Antoinette**, queen of France, character, 6-188, 191  
   and her children, costumes, 9-\*9  
   and Gluck, 12-\*271, 272  
   and Mozart, 12-266

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Marie Antoinette—continued**

- execution, 6-191, 194  
 Franklin befriended by, 8-307  
 Marietta, Ohio, named after, 8-306  
 on way to guillotine, 6-191  
 palaces at Versailles, 11-\*489  
 pastoral life at Versailles, 9-†79  
 portraits, 6-\*186; 9-\*79  
   by Madame Vigée-Le Brun, 11-289  
**Marie de' Medici**, queen regent of France, 6-180  
 arrival at Marseilles painted by Rubens, 11-\*221, 225  
 commissions Rubens to decorate palace, 11-224  
**Marie de Molina**, mother of Fernando IV of Castile, 6-\*320  
**Marie Louise**, empress of the French, 6-†268  
 marriage to Napoleon, 12-428  
**Marietta**, Ga., monument, 8-84  
**Marietta**, Ohio  
   burial mound, 7-\*96  
   founded, 8-306  
   Ohio Land Company office, 7-\*215  
**Marignano, Battle of**, 9-\*173  
   Switzerland's losses, 6-250  
**Marigold**, flower, 2-\*170  
**Marina**, Indian princess, aids Cortes, 7-74  
**"Marine,"** painting by Edward Moran, 11-\*369  
**Marine corps**, U. S., *see* United States Marine Corps  
**Marine life**, *see* Ocean, animal and plant life  
**Marine stations**, United States, 7-490  
**Marine toad**, 3-\*425  
**Marine worms**, 3-†117-26  
   home in sponges, 3-84  
   tube builders, 3-†117-23  
**Mariner's compass**, 10-†455-57  
**"Marinus Willett Preventing the Removal of Arms by the British,"** 7-\*162  
**Marion**, Fort, St. Augustine, Fla., 7-†411; 8-76-A  
**Marionette shows**  
   how to make, 14-†70  
   "Orlando" played in Italy, 14-337  
**Maris**, Sir Ector de, and Sir Percival, in Arthurian romance, 14-394  
**Maritime Andes of Venezuela**, 5-518-F  
**Maritime provinces**, Canada, history, 7-14, 19, 29-L-N, 33-A  
**Maritsa region**, Bulgaria, 6-368-A  
**Maritsa River**, rising in Bulgaria and flowing into Aegean Sea, 6-368-A  
   basin, 6-368-A  
   map, 6-595  
**Marius, Caius**, Roman consul, 5-219  
   battle with Germans, 6-206  
   Julius Caesar a nephew of, 5-223  
   uncle of Caesar, 12-356  
**Marjoram**, herb, 9-311  
**Mark, Saint**  
   painting by Dürer, 11-\*210, 211  
   painting by Tintoretto, 11-\*182

**Mark, Saint—continued**

- patron saint of Venice, 11-446, 448  
 symbol, 11-77  
**Mark**, king of Cornwall, 13-\*145  
**Mark Antony**, *see* Antonius, Marcus  
**Mark Twain**, *see* Clemens, Samuel Langhorne  
**"Mark Twain,"** meaning of term, 13-329  
**Markets**, outlets for nation's production, 7-576  
**Markets**, fish, 9-\*370  
**Markhor**, goat, 4-\*423, †428  
**Markland**, location, 7-2  
   discovered by Leif Ericsson, 7-111  
**"Marksman, The,"** opera, by Carl von Weber, 12-250, 282  
**Marl belt**, fertile strip of land in N. J., 8-245, 247  
**Marlborough, John Churchill, Duke of**  
   Addison's poem about, 13-181  
   life by Winston Churchill, 12-449-C  
   presented with Blenheim Palace, 12-449-A  
   victories, 6-75  
**Marlowe, Christopher, life: works**, 13-†162-63  
**Marmalade**, orange, 9-172  
**"Marmion,"** by Sir Walter Scott, 13-222  
**Marmora, Sea of**, Turkey, map, 6-595  
**Marmosets**, monkeys, 4-266  
**Marmots**, animals, 4-†371-73  
   companions in burrows of, 4-168  
**Marne**, river, in Northeastern France  
   length, 10-253  
   map, 6-579  
**Marne, Battles of the**, 6-201  
**Maroons**, slaves in West Indies, 7-54  
**Maros River**, Hungary, length, 10-253  
**Marquesas Islands**, Pacific Ocean, ownership, 5-521, 522  
**Marquette, Jacques (Father), life and explorations**, main article, 13-†483-84  
   Arkansas visited, 8-28  
   Illinois, 8-96  
   Iowa, 8-119  
   mission at Mackinac, 8-181  
**Marquette iron region**, 8-186-A  
**Marquette River**, Mich., 8-186-A  
**Marr, Carl**, painting, 11-369  
   "Gossip," painting, 11-\*369  
**"Marriage à la Mode,"** paintings by William Hogarth, 11-\*293, 296  
**Marriage and betrothal rings**, 12-117  
**Marriage at Cana**, subject of miniature, 11-\*102  
**"Marriage Contract, The,"** painting by William Hogarth, 11-\*293  
**Marriage customs**  
   among early peoples, 5-\*85  
   Mohammedan, 5-419  
   Shinto ceremony, 5-341  
**"Marriage of Bacchus and Ariadne,"** painting by Tintoretto, 11-182  
**"Marriage of Figaro, The,"** drama by Beaumarchais, 13-121  
**"Marriage of Figaro, The,"** opera by Mozart, 12-270

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- "Marriage of St. Catherine,"** painting by Mem-  
ling, 11-200
- "Marriage of the Thistle and the Rose,"** poem  
by William Dunbar, 6-119
- Marriage of the Virgin,** subject of Gothic minia-  
ture, 11-\*102
- Marriage or betrothal rings,** 12-\*87
- Marrow,** bone, *see* Bones, marrow
- Mars** (Ares), god, 14-408; 1-†149  
attendants, 1-149  
March named after, 10-482  
painting depicting dispute with Venus, 1-\*149  
Romulus and Remus, 5-204  
why planet named after, 1-149
- Mars,** planet, description, 1-†149-52; table, 1-  
106  
canals, 1-150-51, \*152  
color plate, 1-\*98  
color, 1-149  
color plates, 1-facing 152, 98  
communication with, 1-†152  
gravitation, 1-\*301, 302  
ice caps, 13-404  
moons, 1-151  
Percival Lowell's theories, 13-406-8  
place in solar system, color plate, 1-98; table,  
1-106  
relative size, 1-\*16
- "Mars and Its Canals,"** by Percival Lowell, 13-  
407
- "Mars and Venus,"** painting by Botticelli, 11-  
\*122
- "Mars as the Abode of Life,"** by Percival  
Lowell, 13-407
- Marsden, Samuel,** missionary work in New  
Zealand, 5-534
- "Marseillaise,"** by Rouget de Lisle, 12-†242; 6-  
193
- Marseilles, France,** 10-255  
map, 6-581, K5  
settled by Greeks, 6-165  
tunnel to Rhone river, 10-206
- Marsh, William J.,** composer of state song, 8-  
386-A
- Marsh hawk,** 4-154, \*156
- Marshall, Frank J.,** chess champion, 14-490
- Marshall, General George Catlett,** 6 567, 562  
portrait, 7-343-B
- Marshall, James,** 9-389
- Marshall, John,** chief justice, 7-366, 367, 226  
portrait, 7-\*226, \*366
- Marshall, Thomas R.,** vice president of the  
United States, 12-456-G
- Marshall Islands,** Pacific Ocean, 5-521, 522
- Marshall Plan,** for a new Europe, 6-562-63
- Marshals,** United States, 7-378
- Marshes** (swamps) in spring, 4-100  
draining causes extinction of birds, 7-468
- "Marshes of Glynn, The,"** by Sidney Lanier,  
13-335
- Marsiles, King,** in legend of Roland, 14-338
- Marston Moor, Battle of,** 6-\*65
- Marsupials,** class of animals, main article, 4-  
†459-72  
American, 4-\*468, †469-70  
Australian, 4-†459-72
- Marsyas,** slain by Apollo, 14-460
- Martel, Charles,** *see* Charles Martel
- Martens,** animals, 4-†357, \*358  
Miocene period, 3-54
- "Martha Washington's Kitchen,"** Williams-  
burg, Va., 11-\*504
- Martha's Vineyard,** Mass., island, 8-170-A  
climate, 8-176
- Martial** (Marcus Valerius Martialis), cited, 10-  
461
- Martial eagle,** 4-\*153
- Martin, Benjamin,** 10-488
- Martin, Homer D.,** paintings, 11-\*368, 370
- Martin,** bird, 4-†35
- Martin, Luther,** American lawyer and political  
leader, 12-\*496
- "Martin Chuzzlewit,"** by Charles Dickens, 13-  
245
- "Martin Eden,"** by Jack London, 13-341
- Martini, Simone,** Italian painter, art style, 11-  
117, 120  
"Annunciation," painting, 11-\*117  
"Guidoriccio," painting, 11-\*119, 120
- Martinique,** island, West Indies, description, 7-  
64, \*65  
map, 7-601
- Martinsburg, W. Va.,** 8-436
- Martyrs,** early Christian, *see* Christians, early
- Marvel, Andrew,** 13-167
- Marx, Karl,** 7-549-50, 556, 6-228
- Mary,** name, origin and meaning, 8-†162-B
- Mary, Virgin**  
at temple, 5-125  
medieval worship of, 11-94  
*see also* Madonna in art
- Mary I,** queen of England, reign, 6-48  
marriage, 6-327  
restores Catholic church in Ireland, 6-152
- Mary II,** queen of England, 6-72, †74  
and William of Orange, 6-72, †74
- Mary,** queen of George V, portrait, 6-\*103
- Mary,** queen of Hungary, reign, 6-280
- "Mary Had a Little Lamb,"** nursery rhyme,  
text, color plate, 14-174-G
- Mary Magdalene,** painting by Quentin Massys,  
11-\*200
- Mary of Guise,** marriage to James V; rule of  
Scotland, 6-120
- "Mary of Scotland,"** by Maxwell Anderson,  
13-355
- Mary Stuart, Queen of Scots,** biography, main  
article, 12-†398-401  
Catholic plots against Elizabeth, 6-†55  
entry into Edinburgh, 6-\*117  
imprisonment and death, 12-401, 397  
lace making by, 12-166  
reign, 6-\*118, \*119, 120, 121
- "Mary Stuart,"** by Schiller, 13-279

The asterisk (\*) refers to picture and its explanation only. The cheilisk (†) refers to illustrated text.



**Maryland**, state, U. S., **description and history**,  
main article, 8-†158-62; general data, 8-  
162-A-163

agriculture, 8-162

area, 8-162-A

art centers, 8-162-A

capital, 8-158

charities and correction, 8-162-A

cities, towns, list, 8-160-62, 162-B-163

climate, 8-162-A, 162

constitution, 8-162-A

counties, 8-162-B

delay in ratifying Articles of Confederation,  
7-175, 176

education, 8-162

educational institutions, list, 8-162-A

flag, 8-162-B

government, 8-159

holidays, 8-162-B

Indians, 8-159

interesting facts, 8-162-B

location, 8-162-A

map, 8-504

on United States map, 7-595

monuments, 8-162-A; 7-\*413, 414

motto, 8-162-B

name, 8-162-B

nicknames, 8-162-B

parks, 8-162-A

physical features, 8-162-A, 162

political facts, 8-162-A

products and industries, 8-159, †160-61

religion, 8-158, 159

reservations, bird and game, 8-162-A

rivers, 8-162-A

signs Declaration of Independence, 7-173

state birds, 8-162-B

state flower, 8-162-B

state song, 8-162-B

"The Settlement of Maryland," painting,  
7-\*132

trade, 8-159

"**Maryland, The Settlement of**," picture, 7-\*132

**Maryland yellowthroat**, bird

graph of song, 4-\*5

plant lice eaten by, 4-10

**Maryville**, Tenn., home of Houston, 12-514-15

**Masaccio (Tommaso Guidi)**, paintings, 11-  
†132-34

copied by other artists, 11-136, 166

"Tribute Money," painting, 11-\*133

**Masaryk, Thomas**, aids Czechoslovakia: made  
president, 6-360

**Masbate**, island, Philippines, area, 5-570

map, 5-595

**Mascoutins**, Indian tribe, Wisconsin, 8-440

**Masefield, John**, **life and works**, main article,  
13-270

portrait, 13-\*270

**Mashie**, golf club, 14-495, 497

**Masked crab**, 3-†179

## Masks

Egyptian 11-\*20

Hawaiian, 8-\*458

Mycenaean (portrait mask), 11-\*34

Roman, 11-69

used in Greek plays, 12-\*324; 13-\*38

wooden, 12-96, \*98, 100

American Indians, 7-98, \*100, \*107

**Mason, George**, American revolutionary leader,  
12-\*496

**Mason, James Murray**, taken from "Trent,"  
7-258

**Mason, John, Captain**, 8-242-A

land grant of Maine, 8-152

**Mason, William**, builds locomotive, 10-\*182

**Mason and Dixon's line**, 8-336

**Mason bee**, 3-302, †303

**Masonic order**, origin, 11-468

**Mass**, physics

attraction of masses, 1-16, 302

difference between weight and, 1-303

**Mass, Roman Catholic**

Bach's arrangement in B minor, 12-230

Palestrina's settings, 12-260

**Mass consumption**, 7-567

"**Mass of Pope Marcellus, The**," by Palestrina,  
12-260

"**Mass of St. Cecelia**," by Charles Gounod, 12-  
307

"**Mass of the Dead**," symphony by Berlioz,  
12-306

**Mass production**, 7-501, 566, 567, 574

New England's backwardness, 8-240

**Massachusetts**, state, U. S., **description and  
history**, main article, 8-†165-76, general  
data, 8-176-A-177

agriculture, 8-176

area, 8-176-A

capital and capitol building, 8-\*165

charities and correction, 8-176-A

charter, 8-172; 7-125, 128

cities, towns, list, 8-176-B-177

industries and facts concerning chief cities,  
8-170 fol.

climate, 8-176-A

counties, list, 8-176-B

education, 8-175

educational institutions, list, 8-176-A

flag, 8-176-B

early, 14-574

extends sway over New Hampshire colonies,  
8-237

first mail service, 10-87

Franklin represents, in England, 12-466

harbors, 8-176-A

holidays observed, 8-176-B

Indians, 8-167

intellectual contributions, 8-176

libraries, 8-176-A; 10-556, 558

location, 8-176-A

map, 8-507

on United States map, 7-595

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Massachusetts**, state, U. S.,—*continued*

- motto, 8-176-B
- name, 8-176-B
- nicknames, 8-176-B
- physical features, 8-176-A, 176
- political facts, 8-176-A
- products and industries, 8-†172 fol.
  - cotton manufacture, 9-34
  - fishing and whaling, 8-168, 169; 9-365-66
  - glass manufacture, 12-36
  - granite, 9-380
  - minerals, 8-166
  - shoe industry, 8-\*171; 9-59
- Province of Maine owned by, 8-152
- races represented, 8-175
- rainfall, 8-176-A
- rivers, 8-176-A
- signs Declaration of Independence, 7-173
- state bird, 8-176-B
- state flower, 8-176-B
- state song, 8-176-B
- trade, 8-169-70
- transportation, 8-171
- waterways, 8-176-A
- "Massachusetts," song, 8-176-B
- Massachusetts Bay Colony**, 8-165-76
  - charter, 8-171
  - claims in Maine, 8-152
  - migration due to strictness, 8-56
- Massachusetts Bay Company**, 7-125
- Massachusetts Indians**, 8-176-B
- "Massacre at Chios," painting by Delacroix, 11-\*323, 328
- Massacre of Glencoe**, 6-129
- "Massa's in the Cold, Cold Ground," song, 8-138-B
- Massasoit**, Indian chief, 7-145
- Massawa**, seaport of Eritrea, Africa, 5-457
- Massé shot**, billiards, 14-\*481
- Massey, W. F.**, 5-540
- Massys, Quentin**, art style, 11-202
  - painting of Mary Magdalene, 11-\*200
  - visited by Dürer, 11-211
- Mastabas**, *see* Tombs, Egyptian
- "Master Bagpipers, The," by George Sand, 13-130
- "Master Builder, The," play by Ibsen, 12-333
- Masterpiece**, origin of term, 5-310
- Masters**, in medieval guilds, 5-310
- Mastersingers**, musicians, 12-217
- "Mastersingers of Nuremberg, The," opera by Wagner, 12-217, 251
- Mastication of food**, effect upon teeth, 2-311, 312
- Mastiffs**, dogs, 4-503
- Mastodons**, prehistoric animals, 3-\*48; 4-†344
- Masts**, sails named for, 10-171
- Masters, Edgar Lee**, poet, 13-350
- Masurium**, element, symbol, atomic no. and wt., 1-\*551
- Matabele**, African Negroes, warfare, 5-481
- Matagorda Bay, Tex.**, 8-377
- Matamata**, turtle, 3-480

- Matanuska Valley**, Alaska, settlement, 8-13
- Matanzas, Fort**, national monument, Florida, 8-76-A
- Matanzas Bay**, Cuba, attempt to use waters of as energy source, 1-\*346
- Matches**, manufacture, 10-332, \*335
  - earliest made, 10-332
  - production in Sweden, 6-407
- "Mateo Falcone," by Prosper Mérimée, 13-131
- Materials**, cotton, 9-29
- Mather, Cotton, Dr.**, library collection, 10-556
- Mathematicians**, biography
  - Descartes, René, 13-†13
  - Euclid, 13-†373
  - Huygens, Christian, 13-†377
  - Khayyam, Omar, Persian mathematician, 13-89
  - Laplace, Pierre Simon, Marquis de, 13-†405
  - Leibnitz, Gottfried Wilhelm, 13-†14
  - Newton, Sir Isaac, 13-†400
  - Pythagoras, 5-160
- Mathematics**, main article, 10-†428-40
  - astronomical, of Laplace, 13-406
  - counting, 10-†420-26, 429
  - foundation of Greek education, 13-7
- Mather, Richard, Reverend**, early Boston settler, 8-167
- Matilda**, empress, daughter of Henry I, claims throne of England, 6-20
- Matilda**, queen of William the Conqueror, Bayeux tapestry made by, 1-\*162
- Matisse, Henri**, paintings by, 11-\*387, 390
- Matrix**, in typesetting machine, 10-53, \*55
- Matrix**, in stereotypy, 10-\*80, 82
- Mats**, used in storing cargoes, 10-239
- Mattamuskeet, Lake, N. C.**, area, 8-296
- Mattaponi River, Va.**, 8-418
- Mattathias**, priest of Modin, revolution against Syria, 5-129
- Matteotti**, Italian Socialist, murder of, 6-314
- Matter, origin and nature of**, main article, 1-†280-84, 2
  - ancient theories, 1-281, 531; 13-2
  - and electricity, 1-284, 500
  - attraction between all objects, 1-302
  - changes in physical states, 1-†402-10
  - cold causes contraction, 1-†477-83
  - conservation of, 1-283
    - discovered by Lavoisier, 13-381
  - effect of shrinkage upon, 1-3, 6
  - expansion and contraction, 1-476-83
    - substances listed according to rate of, 1-481
  - friction, 1-†315-21
  - laws of motion, 1-†286-92, †294-97, 306-13
  - properties, 1-361
- Matterhorn**, mountain peak, Alps, 6-\*244; 1-25
  - map, 6-584, B3
- Matthew Saint**, apostle, symbol, 11-77
- "Matthew," Cabot's ship, 13-472
- Matthias**, Holy Roman emperor, 6-262
- Matthias I, Corvinus**, king of Hungary, annexes Austria, 6-281

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Matzoth**, Jewish (unleavened) bread, 9-240  
**Mauch Chunk**, Pa., coal mining, 8-337  
**"Maud Muller,"** by Whittier, 13-307  
**Maui**, island, Pacific Ocean, area, 8-461  
 • map, 8-562  
**Maumee River**, Indiana and Ohio, 8-312-A  
 trading post established, 8-305  
**Mauna Loa**, volcano in Hawaiian Islands, 8-461  
**Maupassant Guy de**, life and works, main article, 13-†134  
 portrait, 13-†134  
**"Mauretania,"** ship, speed record, 10-223  
**Maurice River**, N. J., 8-252  
**Mauritania**, colony, Africa, 5-473  
**Mauritius**, island, Indian Ocean, extinct birds, 4-†239  
**Maury, Matthew F.**, report on undulating plain in ocean, 10-102  
**Mausoleum**, origin of word, 5-185  
**Mausoleum of Halicarnassus**, 5-185, \*186; 11-52, 53  
**Mausolus**, king of Caria, statue, 11-†53  
**Mawson, Sir Douglas**, in the Antarctic, 13-510  
**Maxentius, Marcus Aurelius Valerius**, defeated by Constantine, 12-364  
**Maximian**, archbishop of Ravenna, throne, 12-†181  
**Maximilian I**, Holy Roman emperor, reign, 6-211  
 crowns Ulrich von Hutten, 6-\*211  
 defeated by Swiss, 6-250  
 Durer at court of, 11-211  
 strengthens and enlarges Austrian dominions, 6-260  
**Maximilian II**, Holy Roman emperor, and Protestantism in Austria, 6-261  
**Maximilian** (Ferdinand Maximilian Joseph), emperor of Mexico, 7-85  
 sentenced to death: courage, 7-\*85, 86  
**"Maximilian, Execution of,"** painting by Manet, 11-†341  
**Maximin** (Caius Julius Verus Maximinus), Roman emperor, condemnation of St. Catherine and her converts, 13-527  
**Maxwell, James Clerk**  
 electric wave discoveries, 10-115  
 portrait, 1-†418  
 predicts possibility of radio waves, 1-418  
**May**, month of noblemen, 11-97  
 origin of name, 10-482  
**May bugs**, 3-338  
**May Day**, observance of: customs, 14-582  
 celebration in England, 12-326  
**May-flowering tulip**, 2-230  
**May fly**, 3-\*387, 388, \*389  
 not true fly, 3-357  
**Mayas**, Indians, 7-†90-91  
 buildings and cities, 5-19; 7-90  
 calendar, 10-\*478, \*480; 7-42, 44  
 compared to Incas, 5-495  
 Central America, 7-\*42, 44  
 descendants, 7-43  
**Mayas**, Indians—*continued*  
 inscriptions, 10-\*34, \*478  
 Mexico, 7-68  
**Mayflower**, state flower of Massachusetts, 8-176-B  
**"Mayflower,"** ship, 10-\*158; 7-\*125, \*126, \*127; 12-555-A  
**Mayflower Compact**, 8-166  
**Maynard, Lieutenant**, combat with pirate, 8-288  
**Mayor**, powers and duties, 7-391  
**"Mayor of Casterbridge, The,"** novel by Thomas Hardy, 13-264  
**Mayors of the palace**, rulers of France, 6-167  
**Maypop**, flower, *see* Passion flower  
**Mayrhofer**, Austrian poet, and Franz Schubert, 12-285  
**Mazama**, Mount, extinct volcanic peak, 8-325  
**Mazarin, Jules**, cardinal  
 power in France, 6-†181  
 prophecy about Louis XIV, 12-410, 411  
**Mazda** (Ahuramazda), Persian spirit of good, 5-102  
**Mazo, Bautista del**, copies work of Velasquez, 11-257  
**Mazzini, Giuseppe**  
 founds Young Italy society, 6-306  
 influence on Swinburne, 13-259  
 leads fight for Italian independence, 6-306  
**Mc**, prefix, all names preceded by "Mc", as McKinley, are listed in index under the "Mac's"  
**Mead, Lake**, Nevada, 8-234-A  
**Meade, George Gordon**, at Battle of Gettysburg, 7-263  
**Meade, Fort**, Maryland, war prisoners' quarters, 6-\*530  
**Meade River**, Alaska, 8-16  
**Meadow lark**, 4-†86-87, \*9, \*224  
 graph of song, 4-\*5  
 Montana's state bird, 8-220-A  
 not true lark, 4-87  
 state bird of Wyoming, 8-454-A  
**Meadow pearl** (daisy), 2-\*174  
**Meany, Edmond S.**, song by, 8-428-A  
**Measure**, music, 12-215  
**"Measure for Measure,"** Wagner's opera "Forbidden Love" adapted from, 12-294  
**Measurement**  
 how to teach child, 10-431  
 of children, chart, 2-363  
**Measures and weights**, main article, 10-†370-77  
 metric system, 10-376  
 Sumerian, 5-82  
**Measuring**  
 by shadows, 13-2  
 distance across river, 1-172  
 distance to a star, 1-†172  
**Meat**, animals which can be used as, main article, 9-†317-20; kinds, 9-\*325  
 buccaneers' method of curing, 10-170  
 definition, 9-317  
 for campers, 14-554

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Meat**—*continued*

- frozen, exported by New Zealand, 5-540  
 growth of doubled by aureomycin, 9-\*216  
 Middle Ages, 7-434  
 muscle the part eaten, 2-327  
 nuts a substitute for, 9-198  
 pellagra cured by milk and, 2-364  
 preservation, 9-\*229, †324 fol.
- Meat industry**, main article, 9-†322-29  
 by-products, 9-323, 324, 328  
 exports, 9-329  
 government inspection 9-322 \*327, 328  
 live-stock transportation, 9-326, \*327  
 packing, 9-†332, 324-29  
   Illinois, 8-102  
   Iowa, 8-123  
 production, U. S., 9-318, 325, 329  
   Ohio, 8-309  
   Texas, 8-385  
 Union Stock Yards, Chicago, 8-\*100
- Mecca**, Arabia, **pilgrimage to**, main article, 5-†416-23; 13-521  
 burned and rebuilt, 5-398  
 Great Mosque and Kaaba, 5-421, †422  
 holy city, center of Mohammedanism, 13-521 fol.; 5-416, 421  
 market city of Arabia, 13-471  
 taken by the Wahhabis, 5-400  
 terrible city, 5-422
- Mechanical energy**, 1-340, \*345, 347, 349
- Mechanical man**, 1-\*412
- Mechanical pressure of light**, 1-162
- Mechanics**, first book on, 13-4
- Mechanized army**, in World War II, 10-366
- Mechlin** (Malines), lace, 12-\*165, \*169, 170
- Meck, Madame von**, patron of Tchaikovsky, 12-314
- Mecklenburg Bay**, Germany, map, 6-582
- Mecklenburg-Schwerin**, map, 6-582
- Medano River**, U. S., disappearance, 8-52-B
- Medea**, enchantress, 14-447  
 aids Jason, 14-450  
 "Medea," by Euripides, 13-38
- Medes**, earliest Indo-Europeans, 5-97  
 conquest by Persians, 5-102  
 first appearance in history, 5-100  
*see also* Persians
- Media**, ancient kingdom, map, 5-\*88
- Median nerves**, 2-\*393
- Mediation**, Act of, Switzerland, 6-253
- Mediation and Conciliation**, Board of, 7-316
- Medicean moons of Jupiter**, 1-155
- Medici, Catherine de'**, reign, 6-†174, \*175, 176  
 lace making by, 12-166
- Medici, Cosimo de'** (the Elder)  
 patron of art, 11-127 fol., \*482  
 portraits, 11-122, \*135, 138, 147  
 Roger van der Weyden employed by, 11-200
- Medici, Cosimo de'** (the Great), besieges Siena, 6-301
- Medici, Giovanni de**, patron of art, 11-126, 127

**Medici, Giuliano de'**

- Michelangelo's sculptures for tomb of, 11-\*159  
 portrait statue, 11-\*159

**Medici, Lorenzo de'** (the Magnificent), 13-539-40

- contemporaries, 6-302  
 Michelangelo's association with, 11-160  
 Michelangelo's sculptures for tomb of, 11-†159, \*160

- patron of art, 11-143  
 portrait statue, 11-\*160  
 portraits, 11-\*135, 138

**Medici, Marie de'**, queen regent of France, *see* Marie de' Medici**Medici, Piero de'**

- orders paintings for Medici chapel, 11-137  
 portraits, 11-\*122, \*135, 138, 147

**Medici family**

- portraits, 11-122, 135, 138, 147  
 pottery, 12-58  
 rulers of Florence, 6-301, 302  
 treatment of Machiavelli, 13-70

**Medici Venus**, statue, 11-\*65**Medicinal plants**, main article, 9-†216-19-B

- ferns, 2-90  
 North Carolina's production, 8-294

**Medicine**

- aided by microscope, 10-486  
 anaesthetics, 10-550  
 antiseptics, 10-550; 13-372  
 chemistry in, 10-549  
**Galen and his studies**, 13-†358-59  
**Hippocrates the father of**, 13-†357-58  
 nitroglycerin, 10-417  
 plants used for, 2-2  
 public health, 7-423  
 state, Saskatchewan, 7-29-U  
 sulfa drugs, 10-547  
 superstitions of early times, 13-357  
 use of radium in, 9-426  
 use of X rays in, 10-493, †494, \*495  
 vaccination, 13-†366

**Medicine Bow Mountains**, range of Rocky Mts.  
 in Wyo. and Colo., 8-454**Medicine cabinet**, first aid articles needed, 2-402**Medicine men**, 9-216; 5-446

- curing carache, 5-\*477  
 Eskimos, 7-36  
 Indian, 7-96, 100

**Medicine dropper**, principle of, 1-463**Medieval architecture**, *see* Architecture, Gothic;  
 Architecture, Romanesque**Medieval art**, *see* Middle Ages, art**Medieval period**, *see* Middle Ages**Medina**, Arabia

- importance in Moslem empire, 5-398  
 Mohammed's flight to, 13-523  
 taken by the Wahhabis, 5-400, 401

**"Meditation,"** statue by Victor Salvatore, 11-\*373**"Meditations"** of Marcus Aurelius, 13-57

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Mediterranean race**, 5-267, 271  
 where found, 5-†39
- Mediterranean Sea**  
 arms of, 6-6-A  
 islands, 6-†471-80  
 maps, 6-570; 5-573  
 red coral in, 3-102  
 sponge fisheries, 3-86  
 "Venus' girdle" found in, 3-113
- Mediterranean trade**, 10-234-35
- Medulla oblongata**, anatomy, 2-\*385
- Medusa**, mythological character, 14-\*410, 446  
 "Medusa," raft, survivors of, painted by Gérôme, 11-†322
- Medusa head starfish**, 3-134
- Meer, Jan van der**, see Vermeer
- Meerkat**, animal, 4-\*284
- Meerschbaum**, mineral, found in Turkey, 5-414-B
- "Meeting, The,"** painting by Gustave Courbet, 11-340
- "Meeting of Saint Joachim and Saint Anna at Jerusalem,"** painting by Giotto, 11-\*115, 118
- Meetinghouse**, see Church
- "Megalithic,"** meaning, 6-475
- Megalopas**, genus of crab, 3-178
- Méga-Mowries, Hippolyte**, 9-372
- Meighen, Arthur**, Canadian premier, 7-29
- Meiji (Mutsuhito)**, emperor of Japan, 5-363
- Meissen**, Germany, porcelain, 12-60
- Meissonier, Jean Louis Ernest**, paintings by, 11-339, 340  
 "The Lute Player," painting, 12-\*215
- "Meistersinger von Nürnberg, Die,"** opera by Wagner, 12-frontispiece, 217, 251  
 harp in, 12-258-A
- Meistersingers**, musicians, 12-frontispiece, 217
- Meitner, Lise**, scientist, 1-558-D
- Mekong**, river of Southeastern Asia, rising in Tibet flowing into China Sea, 5-430, 430-B  
 length, 10-253  
 map, 5-588, 581
- Melamine plastic**, 10-553
- Melanesia islands**, Pacific Ocean, map, 5-597
- Melanesians**, people, description, 5-531  
 in Pacific islands, 5-521, 525
- Melbourne**, Australia, 5-552, 556, 557  
 former capital of Commonwealth, 5-560
- Melchior, Wise Man**, 5-\*101
- Meleager**, Greek hero, 11-\*107, 108
- Melford**, Oregon, pear industry, 8-330
- Melia crab**, 3-\*94
- "Meliador,"** by Froissart, 13-104
- Mellen, Ida M.**, "Fishes in the Home," 14-5
- "Melon Eaters, The,"** painting by Murillo, 11-\*255
- Melon family**, fruit, 2-256
- Melozzo da Forlì**, paintings by, 11-143
- Melpomene**, muse of tragedy, 12-\*205
- Melting**, cause of, 1-\*403, 407
- Melting points**, 1-\*392
- Melville, Herman**, life and works, main article, 13-†324-25  
 "Moby Dick," 9-365  
 portrait, 13-\*325
- Memel**, Lithuania, 6-460
- Memel River**, Europe, see Niemen River
- Memling, Hans**, art style, 11-200  
 nationality, 11-197  
 "St. John the Baptist," painting, 11-\*196
- Memorial Day**, observance of, 14-584
- Memorials**, U. S., main article, 7-†411-14
- Memory**, seat of, in brain, 2-387
- "Memory,"** sculpture by French, 11-\*360
- Memory game**, 14-155
- Memphis**, ancient capital, Egypt, 5-52; 11-409  
 tomb of sacred bulls, 5-67
- Memphis**, Tenn., 8-371  
 founded, 8-369
- Memphremagog, Lake**, Vermont and Canada, rivers draining into, 8-404
- "Men without Women,"** by Hemingway, 13-351
- Menageries**, 4-†474-81
- Menam River**, Siam, 5-430-A
- Mendel, Johann Gregor**, life and work, main article, 13-†413-15  
 portrait, 13-\*413
- Mendel's law**, 13-415
- Mendelssohn, Moses**, 12-286  
 founder of modern Judaism, 5-138
- Mendelssohn-Bartholdy, Fanny**, 12-286, 288, 308
- Mendelssohn-Bartholdy, Jakob Ludwig Felix**, life and works, main article, 12-†286-88  
 Chopin and, 12-292  
 influences Gounod, 12-308  
 music, 12-245  
 portraits, 12-\*241, \*286  
 trombone music, 12-258-B
- Mendicant friars**, 5-277
- Mendoza, Antonio de**, viceroy of Mexico, 7-80
- Menelaus**, king of Sparta, 13-28
- Menelaus and Hector**, Greek painting, 11-36
- Menes**, first king of Egypt, 11-409; 5-51
- Menezes, Jorge de**, in New Guinea, 5-545
- Mengs, Raphael**, German painter, 11-307
- Menhaden**, commercial fish, 9-370
- Menlo Park**, New Jersey, Edison's laboratory at, 10-\*392; 13-442, 443
- Mennonites**, in Pennsylvania, 8-335
- Menominee Indians**, in Wisconsin, 8-440  
 headdress, 9-\*93  
 medicine men, 8-\*441
- Menom'nee iron district**, Mich., 8-186-A
- Menominee River**, 8-446
- Mensheviks**, Russian Socialists, 6-439
- Menshikov, Alexander Danilovich**, Russian statesman, 6-430
- Mentawi Islands**, Indian Ocean, maps, 5-596
- Menthol**, drug, 9-219-A
- Mentuhotep**, king of Egypt, 5-59
- Menzala, Lake**, Egypt, map, 5-578
- Menzies, Robert Gordon**, Australian premier, 5-560-C

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Mephistopheles**  
 in Goethe's "Faust," 13-282  
 in Marlowe's "Dr. Faustus," 13-\*162
- Merak**, star, one of "Pointers," star maps showing:  
 July and August, 1-178-G  
 March and April, 1-178-C  
 May and June, 1-178-E
- Mercado, Antonio Rivas**, monument by, 7-\*82
- Mercaptan**, chemical, odor, 2-309
- Merced River**, Calif., 8-42
- Mercedario, Cerro del**, peak, Andes Mts., between Chile and Argentina, 1-28
- Mercenaries**, Greek, 5-177
- Mercer, Charles Fenton**, death of, painting by Trumbull, 11-\*354
- Mercer, John**, and "mercerizing" process, 9-29
- Mercurizing process**, 9-29
- Merchandising methods**, 7-538, 567
- Merchant**, game, 14-164
- Merchant marine**, main article, 10-†231-42  
 list, 10-232
- "Merchant of Venice,"** by Shakespeare, 13-\*157, 158
- Merchant vessel**, square-rigged, names of sails on, 10-†171
- Merchants' guilds**, Belgium, 6-348
- Mercury**, element, 9-416  
 ancient ideas about, 1-281  
 boiling point, 1-\*392  
 cohesive force of molecules, 1-\*359, 360  
 freezing point, 1-\*392  
 frozen by liquid air, 1-406  
 iron floats in, 1-472  
 pressure, 1-368  
 symbol, atomic no. and wt., 1-\*551  
 uses, 1-538  
   barometer, 1-260  
   photography, 10-448  
   thermometers, 1-207
- Mercury (Hermes)**, god, 14-\*408, 409; 1-147; 10-\*32  
 ability to fly, 10-313, \*314  
 aids Perseus, 14-446  
 Hermes of Praxiteles, statue, 5-19  
 visit to Philemon and Baucis, 14-451
- Mercury**, planet, 1-146-47; table, 1-106  
 color plates, 1-facing 144, 98  
 place in solar system, color plate, 1-98; table, 1-106  
 relative size, 1-\*16  
 transit, 1-146  
 twinkling of, 1-175
- Mercury fulminate**, 10-417
- Mercury thermometer**, 1-482
- Mercury vapor lamp**, 10-392
- "Mercy,"** painting, 13-\*553
- Meredith, George**, life and works, main article, 13-†261-63  
 portrait, 13-\*263
- Merelli**, impresario, and Verdi, 12-300
- Mergansers**, wild ducks, 4-120
- Mergenthaler, Otto**, invents linotype machine, 10-78
- Mérida Cordillera**, or Sierra de Mérida, Venezuela, 5-518-A
- Meriden**, Conn., 8-60
- Meridian**, Miss., truck gardening center, 8-205
- Meridian**, 180th, 10-†470-72
- Mérimée, Prosper**, character; writings, main article, 13-131  
 portrait, 13-\*131
- Merino sheep**, 9-†75
- Merit badges**, Boy and Girl Scouts, 14-543, 545, 547
- Merlin**, magician in Arthurian romances, 14-†378
- "Merlin,"** poem by Robinson, 13-349
- Mermaid Tavern**, London, 13-163
- Mermaids**, in Greek mythology, 14-435
- Mermaids' purses**, egg cases of fishes, 3-210
- Mernere**, king of Egypt, 5-56
- Merostomata**, crustaceans, in Cambrian period, 3-10
- Merovingians**, France ruled by, 6-167
- Merrifield Hall**, building, 8-\*299
- Merrilies, Meg**, character in Scott's novel, 13-222
- "Merrimac,"** first iron-clad warship, 13 †439, 440  
 battle with "Monitor," 7-\*259; 10-†360; 13-†439
- Merrimack River**, New Hampshire and Massachusetts, 8-242-A  
 Massachusetts, 8-176-A  
 power furnished by, 8-172
- Merritt Parkway**, Connecticut, 8-61
- Merry Monarch** (Charles II), 6-72
- "Merry Wives of Windsor,"** by Shakespeare, scene from, 13-\*159
- Mersey River**, England, map, 6-572
- Meru**, Holy city of Brahma, 5-366
- Méryon, Charles**, 10-65
- Mesa**, in physiography, 1-25  
 Indian villages built on, 7-94; 8-255
- Mesa**, Ariz., 8-22
- Mesa Verde National Park**, Colorado, Cliff Palace, 8-52-B, †50  
 Cliff Palace, 7-\*95
- Mesabi Range**, U. S., iron deposit, 9-\*399, 408
- Mescal button**, pigmy cactus, 2-253
- Mesenteric artery**, 2-\*380
- Meseta of Spain**, tableland, 6-342-A
- Mesha**, king of Moab, story of, 5-125
- Mesilim**, king of Sumeria, 5-80
- Meson**, electric particle, 1-558-H
- Mesophyll of leaf**  
 arrangement, 2-26  
 diagram, 2-\*48
- Mesopotamia**, region, Asia  
 antiquities, 5-11 fol.; 9-\*240  
   *see also* Assyro-Babylonian art  
 architecture, *see* Assyro-Babylonian architecture  
 art, *see* Assyro-Babylonian art

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Mesopotamia—continued**

- cradle of civilization, 9-<sup>\*</sup>240
- desert, 7-465
- dwellings, 11-396
- location, 5-†76
- products for export, 10-262
- rivers, *see* Euphrates River; Tigris River
- trade; transportation, 10-262
- see also* Iraq

**Mesozoic (Middle Life) era, 3-†37-44, 6**

- forms of life in, table, 3-64
- rock formations, table, 1-<sup>\*</sup>40
- strata and fossils, 3-<sup>\*</sup>8

**Messengers, *see* Couriers****Messenia, district of Greece, on map, 5-<sup>\*</sup>150****Messiah**

- Jewish hopes of; false Messiahs, 5-138
- see also* Jesus Christ

**"Messiah, The," by Handel, 12-†232****Messina, Antonello da, *see* Antonello da Messina****Messina, Italy, earthquake, 6-309****Messina, Straits of, Fata Morgana (mirage), 1-<sup>\*</sup>425****Mestizos, people, in Latin America, 5-518-B**

- Central America, 7-42
- Mexico, 7-78

**Meta Sudans, Roman fountain, 5-<sup>\*</sup>248****Metabolism in human body, 2-†360-67****Metal work (*see also* entries under main subjects listed below)**

- bronze, 12-†12-24
- furniture, 12-199
- goldsmithing and silversmithing, 12-†79-92
- ironwork, 12-†1-10
- jewelry, 12-†117-26
- of the Egyptians, 11-†8
- skill of Sumerians, 11-<sup>\*</sup>23, †24

**Metallurgical industries, of the United States, 7-343-†****Metals, 9-†387-408, 415-26 (*see also* Contents Volume 9 for chapter headings)**

- alloys, 9-420
- attracted by magnets, 1-486
- colored by Japanese, 12-100
- core of earth made of, 1-32
- earliest used by man, 9-419
- ductility and malleability
  - copper, 9-419
  - gold, 9-396
  - platinum, 9-422
  - silver, 9-389
- electrical resistance, 1-515
- electricity conducted by, 1-514
- electrochemical action, 1-†496-500
- elements, 1-534
- expansion and contraction, 1-†477-82
- forging of, a primitive industry, 5-36
- heat conductors, 1-396, <sup>\*</sup>397
- foundation for enamel, 12-63
- heaviest; osmium, 9-418
- lightest; aluminum, 9-420
- melting, 1-<sup>\*</sup>403, 407

**Metals—continued**

- odds and ends among, 9-†416-22
- "pot metal" (glass), 12-30
- refining, 9-394, †416
  - by electricity, 9-394, 416
- used for coins, 7-502, 507
- used in thermometers, 1-391
- see also* Minerals; *see also* names of metals, as Gold; Silver

**Metamorphosed rock, 1-<sup>\*</sup>40****"Metamorphoses," by Ovid, 13-51, 52****"Metaphysicals," term applied to poets, 13-353****Metaphysics, 13-22****Metastasio (Pietro Antonio Domenico Bonaventura Trapassi), and Haydn, 12-274****Metaxas, John, General, Greek dictator, 6-368-B; 5-182****"Métayage," French rent plan, 7-66****Metchnikoff, Elie, pathological discoveries, 2-344, 349****Meteor, meaning of word, 1-165; *see also* Meteors****Meteorites**

- burned by friction with air, 1-320, 321
- largest found, 1-<sup>\*</sup>161, †165-66

**Meteorology, definition, 1-275; *see also* Contents Volume 1 and also Climate; Weather****Meteors, 1-<sup>\*</sup>161, <sup>\*</sup>162, †164-67**

- composition, 1-167
- meteoric dust, 1-117, 167

**Meter, linear measure, 10-376****Methane, marsh gas, on planets, 1-154, 156**

- mining hazard, 9-<sup>\*</sup>437

**Methodism, religion, 13-549; in Wales, 6-141****Methodist Episcopal church founded, 6-80; 13-550****Methven, Battle of, 12-383****Métis, French-Indian people of Canada, rebellions, 7-24, 26; 13-565****Meton, Greek astronomer, calculates length of year, 5-172****Metopes, in architecture, 11-<sup>\*</sup>418, 421****Metric system of weights and measures, 10-376****Metropolitan Life Building, New York, 11-<sup>\*</sup>517**

- clock, 10-<sup>\*</sup>465

**Metropolitan Museum of Art, New York**

- American furniture exhibition, 12-<sup>\*</sup>174, 195-99
- American sculpture, 11-<sup>\*</sup>373
- American silverware collection, 12-90, <sup>\*</sup>91
- Cristofori's piano in, 12-258-D
- harpichords in, 12-258-D
- method of restoring bronzes, 12-24
- oldest clavichord in, 12-258-D

**Metsu, Gabriel, paintings by, 11-<sup>\*</sup>260****Metternich, Clemens Wenzel Nepomuk Lothar, Prince**

- power and influence, 6-268, 269
- reactionary influence in Germany, 6-226

**Metus, attendant on Mars, 1-149****Metz, France, siege of, in Franco-Prussian War, 6-216****Meunier, Constantine, sculpture by, 11-†344****Meuse-Argonne Operation, World War I, 7-326**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Meuse River**, France to Netherlands, 6-351, 352  
length, 10-253  
maps, 6-579, 593
- Mexican ground dove**, bird, 4-146
- Mexican hairless cat**, 4-488
- Mexican jumping beans**, 2-257
- Mexican spear-nosed bat**, 4-\*272
- Mexican War**, 7-83; 13-†237; 8-37  
Grant's part in, 12-536
- Mexican woodpecker**, 4-\*69.
- Mexicans** (Aztecs), Mexico named for, 7-70
- "Mexico,"** etymology of word, 8-262-A
- Mexico**, country, North America, main article,  
7-†68-87; general data, 7-87-B  
archaeology, 7-†69-72  
area, 7-87-B  
art, native, 11-392  
pottery, 12-\*47; 7-\*70, \*74  
Aztec ruins, 5-19, 7-†68, \*69, \*70  
baseball, 14-508  
climate, 7-87-B  
flag, color plate, 14-following 570, no. 45  
government, 7-87-B  
**history**, 7-†68-87  
Aztec civilization, 7-†70-76  
Toltec civilization, 7-†68-70  
**republic**, 7-†82-87  
California's allegiance to, 8-37  
loss of Texas, 7-83; 12-516  
war with U. S., 7-83, †237  
constitutions, 7-84, 87  
territory lost to U. S., 7-84, 236  
relations with U. S., 1913-16, 7-87, 316;  
12-550  
after overthrow of Porfirio Diaz, 7-87  
**Spanish conquest**, 13-†467-70; 7-73-76  
Spanish rule, 7-†78-81  
*see also* Mexico City
- Indians**  
Aztecs, 7-91, 118  
found by Cortes, 13-†468  
Mayas, 7-†90-91  
Tarascan, 7-83  
*see also* Indians, American
- maps, 7-596, 591; location, 7-87-B  
merchant marine, 10-232  
meteorites found in, 1-165, 166  
Mormons settle in, 8-394  
national costume, 7-\*87-A  
native life, 7-\*72-75, \*78, \*80-81, \*86  
origin of name, 7-70  
people, 7-68, 70, 78, 87-B  
physical features, 7-87-B  
plants, 2-\*ix, \*249  
products and industries, 7-87-B  
chicle, 9-\*290, †292  
cochineal, 9-305  
copper, 9-419  
cotton, 9-28  
fruit growing, 9-194  
mahogany, 9-258  
minerals, 7-33-B; 9-388
- Mexico**, products and industries—*continued*  
oil supply, 7-\*87-A  
opal mines, 9-433  
pearl fishing, 3-163  
rubber, 9-\*263, \*265, \*269  
sarsaparilla, 9-219-A  
silver found in, 9-389  
"Sisal," 9-285  
Spanish cedar, 9-258  
vanilla, 9-207  
provinces, 7-87-B  
rivers, 7-87-B
- Mexico, Gulf of**, No Amer., maps, 7-591, 595
- Mexico City**, Mexico  
Aztec times, 7-72  
besieged by Cortes, 7-76  
bullfighting, 7-86  
had first university in America, 7-79  
legend of founding, 7-70  
National Independence monument, 7-\*82  
taken by General Scott, 7-84, 238  
weather, 7-87-B
- Mexitl**, or **Mexitli**, Mexican god, 7-70, 72
- Mey, Cornelius Jacobsen**, colonizer, 8-272
- Meyerbeer, Jacob**, 12-253  
portraits, 12-\*241, \*253  
"The Huguenots" written by, 12-258-B  
use of harp, 12-258-A  
use of saxophone, 12-258-F
- Mezzotint**, etching in, 10-65
- Miami**, Fla., view of, 8 \*70  
high school, 7-\*101  
hospital, 1-\*200  
resort city, 8-74
- Miami and Erie Canal**, 8-308
- Miami Indians**, in Ohio, 8-305
- Miami valley**, 8-309
- Mica**  
produced in North Carolina, 8-295  
sandstone contains, 1-41  
slate contains, 1-54
- Micah**, Hebrew prophet, 5-126
- Micawber**, a Dickens character, 13-242
- Mice**, 4-379, 383, †384  
scale drawing, 14-\*64
- Michael**, czar of Russia, 6-428
- Michael VIII, Palaeologus**, Byzantine emperor,  
Constantinople regained by, 5-410
- Michelangelo Buonarroti**, life and art, 11-†155-62  
admires Ghiberti's baptistery doors, 12-22  
admires Laocoön group, 11-48  
and Leonardo da Vinci, 11-156  
and Raphael, 11-166, 167  
character, 11-158, 167  
designs for carving, 12-107  
design for dome of St. Peter's, 11-484, \*485  
genius; versatility, 11-162  
in his studio, 12-\*95  
opinions about other artists, 11-125, 128, 140,  
196

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Michelangelo Buonarroti—continued**

paintings

"Fates," 14-451

"Holy Family," 11-156

- Sistine Chapel, general view, 11-157

"Creation of Man," 11-158

poetry, 11-162

portrait of, by Venusti, 11-156

pupil of Ghirlandaio, 11-145

sculptures

"David," 11-155

figures for the Medici tombs, 11-159

Lorenzo de Medici, 11-160

"Moses," 11-155

- "Pietà" (group for tomb), 11-155

"Pietà" in St. Peter's, 11-161

"Slave," 11-155

**Michelson, Albert A.**, measures speed of light, 1-417

**Michigan**, state, U. S., description and history, main article, 8-179-87, general data, 186-A-187

agriculture, 8-183

area, 8-186-A

canals, 8-186-A

capital and capitol building, 8-179

charities and correction, list, 8-186-A

cities, towns, list, 8-183 fol. 187

climate, 8-186-A

suitable for agriculture, 8-183

counties, list, 8-186-B

education, 8-183

institutions of higher learning, list, 8-186-A

flag, 8-186-B

history, 8-181-83

admitted to Union, 8-183

holidays, 8-186-B

Indians, 8-181, 182

reservations, 8-186-B

location, 8-186-A

maps, 8-508

on United States map, 7-595

motto, 8-186-B

name, 8-186-B

nicknames, 8-186-B

parks, 8-186-B

physical features, 8-180, 186-A

political facts, 8-186-A

products and industries, 8-183-86

minerals and mining, 8-185

reservations, game and bird, 8-186-B

rivers, 8-186-A

state bird, 8-186-B

state flower, 8-186-B

state song, 8-186-B

transportation, 8-185

**Michigan, Lake**, No. Amer.

area, 8-446

canal connecting with Illinois River, 8-101

map, 7-595

**Michigan, Lake—continued**

name, 8-186-B

rivers draining into, 8-439

"Michigan, My Michigan," song, 8-186-B

**Michigan, University of**, 8-180, 183

**Michigan State College of Agriculture and Applied Science**, 8-183

**Michigan Territory**, Wisconsin included in, 8-442

**Michilimackinac**, Mackinac Strait, Jesuit mission at, 13-483, 484, 487

**Michoacán**, state, Mexico, map, 7-596

**Micro-organisms**, *see* Unicellular organisms

**Microbes**, *see* Bacteria; Germs

**Micronesians**, people of islands of Pacific, 5-521

**Microphone**

radio, 10-118, †121-K

use in making phonograph records, 10-499, 500

use in sound pictures, 10-504, \*506, \*510

**Microscope**, main article, 10-†485-90

compound, 10-†486

electron, 10-489

high-powered, 13-363

how made by Leeuwenhoek, 13-362

improvements in, 2-279

invention of, 10-488

lenses, 1-434

meaning of word, 10-485

new world opened up by, 2-279

objects disclosed by, 10-†487-90; 2-6

photography, 10-452

white sapphires ground for, 9-432

**Microscopic animals**, 3-69

**Mid-iron**, golf club, 14-497

**Midas**, king of Phrygia

given ass's ears by Apollo, 14-459, 460; 2-302; 5-158

power of changing objects to gold, 14-460

**Middle Ages**, life, history, religion, main article, 5-†262-311 (*see also* Contents Volume 5 for chapter headings)

"Age of Faith," 5-290; 12-182

agriculture, 5-302, \*303

Arabian civilization, 5-399

architecture, *see* Architecture, *subheads* Gothic; Romanesque

armor, *see* Armor, medieval

art, 11-†83-105

importance of church, 5-280

styles

Carolingian, 11-†84-86, 88

Gothic, 11-†92-105, 107, 110

Romanesque, 11-†86-90

*see also* crafts below

banking, 5-298

books, 11-†84-85, 88

Flemish paintings, 11-\*104, 105, †192, 193

bridges, 10-213

castles and castle life, 5-\*302-3, †304-6; 10-356, \*361; 11-476; 12-184

heating of, 10-†380

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Middle Ages—continued**

- chivalry and knighthood, 5-†306-8; 13-145, 146
- church, *see* Middle Ages, history
- cities and towns, 5-†308-11
  - growth and independence, 7-352
  - Hanseatic League, 6-386, 411, 459; 7-352
  - Italian, 5-298, 299; 6-\*292, 296, 299
  - water supply, 10-537
- civilization paving way to modern culture, 5-271
- civilizing influences
  - Byzantine Empire, 5-289
  - church, 5-271, 280
- crafts
  - bronze work, 12-20, \*21
  - carving, 12-†105, 107
  - enameling, 12-\*65, 66
  - furniture, 12-†181-82, †184-85
  - glassware, 12-31
  - goldsmithery and silversmithery, 12-†84 fol.
  - jewelry, 12-124
  - mosaics, glass, 12-112, 114
  - stained glass windows, 12-71, \*75
  - tapestry, 12-142
- crusades, 5-†280-83; *see also* Crusades
- Dante's "Divine Comedy": significance, 6-299
- darkest period, 5-289
- feudal system: barons and serfs, 5-†301-7, 311, 293; 7-351; *see also* Feudalism
- food, 5-303, 305
- German legends, 6-207
- German literature, 6-210
- Gothic cathedrals, 11-96, 459
- Guelphs and Ghibellines, 5-\*293, 297, 299; 6-297
- guilds, 5-310
- highway travelers, 5-307-8
- history, 5-†262-311
  - migration of tribes, 5-†262-71, 289, †290; 6-206
  - modern distribution, 5-271
- church, 5-271, †273-84
  - civilizing influence, 5-271, 280
  - monasteries, 5-271, 278, †308; 11-477; *see also* Monks and monasticism
  - papacy, 5-276, 283
  - papacy moved to Avignon, 5-283, 298
  - Innocent III brings papal power to height, 5-299; 6-298
  - pilgrimages, 5-281; 11-90
  - menace of Mohammedanism, 5-281
    - Moors repulsed at Tours; importance, 5-292
  - religious orders, 5-277, 278
  - growth of heresies, 5-283
    - Inquisition, 5-284
- church and state, quarrels, 5-276, †286, 294-99
  - Henry IV and Gregory VII, 5-296
  - investiture conflict, 6-†208

**Middle Ages, history—continued**

- Guelph and Ghibelline, 5-293, 297-99
- Frederick II, 6-298
- empires and kingdoms
  - Byzantine empire and overthrow by Turks, 5-287-89, †404-11
  - significance of, 5-289
  - Denmark, 6-†409-13
  - England, 5-292; 6-6-39
  - France, 5-290-93; 6-166-76
  - Frankish kingdom, 5-†290-93
  - Clovis, 5-†290-91
  - Charles Martel, 5-292
  - Charlemagne, 5-†292-93
  - Holy Roman Empire, 6-208-12; 5-295 fol.
  - Charlemagne founds, 5-293
  - Italy, 6-†292-300
  - Norway, 6-379-86
  - Sweden, 6-393-97
  - Vikings, 6-374-77
- land tenure, 5-293, 302
- language, Latin made universal, 5-280
- learning, 5-271, 278
- manorial system, 5-†302-3; 9-240
- maps
  - Europe in Charlemagne's time, 5-\*265
  - movement of tribes and races, 6-\*206
- middle class unimportant, 5-308
- music, 12-†210-17
- musical instruments
  - lute, 12-258-D
  - trumpet, importance of, 12-258-B
- name, reason for, 5-266
- naval powers, 10-166, 167
- peasantry, 5-†301-3
- perfumes used, 5-304
- plagues, 6-300
- racial strains, 5-266, 267 fol.
- roads, 10-151
- shelter
  - lord's castle and domain, 5-\*302, \*303, \*304
  - peasant's hut, 5-301, \*303
- spirit of: building of great cathedrals, 11-96
- stories of period retold
  - Arabian Nights' Entertainment, 14-†361-76
  - Beowulf, 14-†318-22
  - Canterbury Tales, 14-†329-36
  - Reynard the Fox, 14-†323-28
  - Robin Hood and His Merry Men, 14-†353-60
  - Roland, 14-†337-42
  - Round Table Romances retold, 14-†377-404
  - Siegfried, 14-†310-17
- time, methods of telling, 10-461 fol.
- tournaments, 10-†354
- towns and town life, *see* Middle Ages, cities and towns
- trade, 10-167
  - crusades' effect on, 5-283
  - guilds, 5-310-11
  - Italy, 6-296, 297
  - spice, 5-304

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Middle Ages**—*continued*  
 transportation, 10-144  
   ships, 10-\*163 fol.  
 war and weapons, 10-†352-56, \*359  
 weights and measures, 10-374
- Middle Class**, 7-436  
   beginning of, 5-311
- "Middle-class Gentleman, The,"** by Molière, 13-112
- Middle Park**, Col., plateau, 8-52-A
- Middlefield**, Conn., 8-60
- "Middlemarch,"** by George Eliot, 13-261
- Middleton**, Sir Frederick Dobson, puts down Métis rebellion, 7-26
- Middletown**, N. J., established by Puritans, 8-251
- Middletown**, Ohio, iron manufacture, 8-311
- Midges**, pollination by, 2-\*106, 110
- Midgets**, caused by hormone deficiency, 2-324
- "Midnight Fires on the Alps,"** picture, 6-253
- "Midnight Ride of Paul Revere, The,"** painting by Grant Wood, 11-\*392-A
- Midnight sun**, 10-\*476; 6-407-A
- Midshipmen**, U. S. Naval Academy, 7-488-B, 488-C
- Midsummer Night festival**, Sweden, 6-404
- "Midsummer Night's Dream,"** by Shakespeare, 13-158
- "Midsummer Night's Dream,"** overture to, by Mendelssohn, 12-288  
   bassoon used in, 12-258-A
- Midsummer's Day**, length, 1-100
- Midway Islands**, Pacific Ocean, 8-464  
   map, 5-572
- Midwife toad**, 3-†425
- Miessner**, W. Otto, music by, 8-186 B
- Mieszko (Mieczyslaw), Duke**, introduces Christianity into Poland, 6-445
- Migrating locust**, 3-346, 368
- Migration**  
   during Ice Age, 3-61  
   influence of climate, 1-\*193, 194  
   of European tribes, 5-262, 264-71, 289-90  
   *see also animal groups, as* Birds, migration:  
     Fishes, migratory
- "Mikado, The,"** operetta by Gilbert and Sullivan, 12-256, 320
- Mikados**, emperors of Japan, become actual rulers, 5-362
- Milady's gown**, game, 14-151
- Milan**, Beatrice d'Este, duchess of, 11-199
- Milan**, Ludovico (il Moro), duke of, patron of arts, 11-154, 199
- Milan**, Italy  
   commerce and industry, 10-260  
   Communist uprising, 6-310  
   Fascist Revolution begun in, 6-312  
   in Middle Ages, 6-296, 297  
   lace making, 12-170  
   map, 6-588, B2  
   razed by Frederick I, 6-209
- Milan**, Italy—*continued*  
   ruled by Visconti family, 6-301  
   taken by Swiss, 6-250
- Milan**, Edict of, issued by Constantine, 12-365
- Milan Cathedral**, 11-\*465
- Milan Decree**, 7-208
- Milanese lace**, 12-170
- Milazzo**, Battle of, 12-\*444
- Mile**, unit of measure, 10-375  
   nautical mile, 10-469  
   origin of term, 10-373  
   square mile, 10-375
- Miles**, Nelson Appleton, campaign against Indians, 8-218
- Miletus**, ancient city, Asia Minor  
   destruction, 5-162, 164  
   home of Thales, 13-2
- Miliary tubercular tissue**, 2-\*347
- Military Academy**, U. S., *see* United States Military Academy
- Military training**, peacetime, 7-474
- Militia**, colonial, 7-472
- Milk**, main article, 9-†331-38  
   bacilli in, 10-\*489  
   canned, 9-338  
   casein products, 10-547, 552  
   coconut, 8-476  
   concentrated, 9-338  
   condensed, 9-338  
   evaporated, 9-338  
   pasteurization, 13-368, \*369; 9-\*337  
   pellagra cured by meat and, 2-364  
   preservation and distribution, 9-†335  
   quantity and quality: best cattle breeds, 9-332, \*333, 334  
   reindeer, 4-411  
   souring due to bacteria, 2-19  
   specific gravity, 1-474  
   statistics, dairy products, 9-338  
   used for secret writing, 14-143  
   used in making margarine, 9-373  
   why a perfect food, 2-363  
   young mammals fed on, 3-68
- Milk River**, Montana, 8-220
- Milk snake**, 3-502
- Milk teeth**, 2-\*313, 314, 315
- "Milk Woman, The,"** painting by Vermeer, 11-\*269
- Milking**  
   ants milking insect "cows," 3-324, †325  
   hand, 9-335  
   machine, 9-335, \*336
- Milkweed**, 2-\*3  
   insect trap, 3-\*271, \*274  
   pods, substitute for kapok, 2-3  
   rubber from, 9-\*262  
   seeds, 2-\*210
- Milky eagle owl**, 4-\*163
- Milky Way** (Galaxy), 1-175, 176  
   Herschel's description, 13-404  
   in Greek mythology, 14-413

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Milky Way**—*continued*  
 nebulae in, 1-183  
 star map, Jan and Feb., 1-178-A
- Mill, Henery**, first patent for typewriting machine, 10-64
- Mill, John Stuart**, biography, main article, 13-†238-39  
 opinion of Coleridge, 13-218  
 portrait, 13-\*239
- Mill, Mrs. John Stuart**, 13-239
- "Mill, The,"** painting by van Ruysdael, 11-†270
- Mill Creek**, W. Va., early settlement, 8-431
- "Mill on the Floss, The,"** novel by George Eliot, 13-261
- Millais, John Everett**, art of, 11-319  
 paintings by  
   Spanish under Pizarro fall upon Peruvians, 5-\*498  
   "The Pot of Basil," 13-\*230
- Millay, Edna St. Vincent**, poet, 13-352  
 background of period, 7-335
- Mille Lacs**, Minn., lake  
 area, 8-198  
 Daniel-Greysolon at, 8-191
- Mille Lacs Bird Refuge**, 8-198-A
- Millenial Diet**, Hungary, 6-286
- Millepedes**, "thousand-footers," 3-†264-67
- Miller, Carl**, sculptor, 11-392
- Miller, Cincinnatus Heine**, real name of Joaquin Miller, *see* Miller, Joaquin
- Miller, Hugh**, serf, living conditions of, 5-302
- Miller Joaquin**, American author on name of Idaho 8-92-B
- Miller Phineas**, 10-406, 407
- Miller's knot**, 14-\*555
- Milles, Carl**, 12-24
- Millet, Francis D.**, painting by, 11-\*363
- Millet, Jean François**, art style, 11-334  
 "Gleaners" painting, 11-\*329  
 salon picture honored, 11-337
- Millet, cereal**, 9-119, \*120
- Millikan, Robert A.**, studies of cosmic rays, 1-351
- Millimeter**, 10-377
- Millinocket**, Maine, paper mills, 8-154
- "Millions of years,"** Egyptian hieroglyph, 10-\*421
- Mills, flour**, main article, 9-†233-36  
 sugar cane, 9-\*114
- Millstone**, 12-\*45
- Millville, N. J.**, glass manufacture, 8-247
- Milne, John**, 1-82
- Milner, Sir Alfred**, in South Africa, 5-487, 489
- Milo maize**, 9-120
- Milo of Crotona**, statue by Puget, 11-\*235
- Miltiades**, Athenian general, in Battle of Marathon, 5-162
- Milton, John**, life and works, main article, 13-†166-70  
 portrait 13-\*168  
 quoted, 12-71, 120  
 secretary to Cromwell, 6-70
- Milwaukee, Wis.**, harbor, 8-\*443  
 manufactures, 8-444; 9-236  
 railroads, 8-443  
 temperature, 8-446
- Milwaukee River, Wis.**, 8-446
- Mimas**, moon of Saturn, 1-156, \*opp. 153
- Mime**, character in "Nibelungenlied," 14-\*312
- Mimic tag**, game, 14-172
- Mimosa trees**  
 destroyed by elephants, 4-343  
 South American forests, 5-518-A
- Mina**, ancient Sumerian unit of measure, 5-82
- Minamoto**, Japanese clan, 5-349
- Minarets**, towers, 11-450; 5-\*403, 405
- Mindanao**, a Philippine Island, area, 5-570  
 "cleaned up" by Pershing, 12-555  
 hut, 5-\*563  
 map, 5-595  
 natives, 5-†562, 563
- Mindanao Sea**, Philippine Islands, map, 5-595
- Mindoro**, island and strait, Philippine Islands  
 area, 5-570  
 map, 5-594
- Mine sweepers**, paravanes, 10-368-B  
 in World War I, 7-326
- Miner bee**, 3-303
- Mineral springs**  
 Arkansas, 8-26  
 Indiana, 8-116  
 Kentucky, 8-134  
 Virginia, 8-415  
 Yellowstone National Park, Wyoming, 1-36
- Mineral waters**, 1-90
- Minerals**  
 asbestos, the most remarkable of, 9-†385  
 Europe, 6-162-C  
 necessary to life, 2-41; 10-545-46  
 paints of, for pottery decoration, 12-46  
 South America, 5-518-B  
 use of, in human body, 2-361  
*see also* Metals, *minerals listed in Contents*  
 Volume 9, and also under names, as Jet; Quartz
- Miners**, people of Nevada, 8-234-B
- Minerva**, goddess, *see* Athena
- Mines**, underwater explosives, in World War I, 7-\*326, 478; 10-368-B
- Mines and mining**  
 Alaska, 8-13  
 Butte, Montana, 8-217  
 coal, 9-\*437, \*439-41, †442-47  
 Colorado, 8-48, \*49  
 copper, 9-\*416, \*419, \*421  
 fire used to crack rock, 1-41  
 gold, 9-393, \*395  
 high temperature in, 1-383  
 Idaho, 8-89  
 lead, 9-416, 418  
 machinery  
   coal breaker, 8-\*114  
   power drill, 9-\*437  
   pumping engine, 10-†397

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Mines and mining—continued**

- safety equipment, 2-426; 9-\*439, \*440
- silver, 8-\*90
- Wyoming, 8-451
- see also under products mined, as Coal; Gold*
- Mines, Bureau of, U. S.,** 7-378
- Ming dynasty, China,** 5-329
  - "Code of the Great Ming," 5-329
  - porcelain, 12-59; 5-330
  - vase, 12-\*57
  - roadway to tombs of, 5-\*324, \*328
- Miniatures**
  - Gothic, 11-\*102
  - painted on cloisonné snuffboxes, 12-\*67
- Minidoka Bird Refuge,** 8-92-A
- Minimum thermometer,** 1-392
- Minin, Russian patriot,** 6-428
- Mining caterpillar,** 3-293
- Mining State (Nevada),** 8-234-B
- Ministry, British government, origin,** 6-78
- Minium, in enamel manufacture,** 12-63
- "Miniver Cheevy," poem by Robinson,** 13-349
- Mink, animal,** 4-†357
- Mink frog,** 3-\*423
- "Minna von Barnhelm," by Gotthold Lessing,** 13-287
- Minneapolis, Minn.,** 8-196
  - beginnings, 8-193
  - located on site of St. Anthony Falls, 8-193
  - milling center, 9-236
  - flour mill, 8-195
- Minneapolis Symphony Orchestra,** 8-197
- Minnesingers, musicians,** 12-216
- Minnesota, state, U. S., description and history,**
  - main article, 8-†189-97; general data, 8-198-198-B
  - agriculture, 8-195, *see also agricultural products listed below under products and industries*
  - area, 8-198
  - capital and capitol building, 8-\*189
  - charities and correction, list, 8-198
  - cities, towns, list, 8-196, 198-B
  - climate, 8-198
  - counties, list, 8-198-A
  - education, 8-196
    - institutions of higher learning, list, 8-198
  - flag, 8-198-A
  - history, 8-191
    - admitted to Union, 8-193
  - holidays, 8-198-A
  - Indians, 8-190
    - raids, 8-193
    - reservations, 8-198-A
    - treaties with, 8-193
  - lakes, 8-190
  - location, 8-198
  - map, 8-510
    - on United States map, 7-595
  - motto, 8-198-A
  - name, 8-198-A
  - nicknames, 8-198-A
  - parks, 8-198-A

**Minnesota, state, U. S.—continued**

- physical features, 8-190, 198
- political facts, 8-198
- population; growth, 8-193
- products and industries, 8-189, 195-96
  - dairying, 8-194
  - iron ore, 8-192; 9-\*399, 408
  - potatoes, 8-\*197
  - wheat, 8-194, 195
- reservations, game and bird, 8-198-A
- rivers, 8-189, 190
- state bird, 8-198-A
- state flower, 8-198-A
- state song, 8-198-A
- "Minnesota," song,** 8-198-A
- "Minnesota, All Hail," song,** 8-198-A
- Minnesota, Territory of,** 8-193
- Minnesota, University of,** 8-190
  - administration building, 8-\*190
- Minnesota River, U. S.,** 8-198
  - headwaters and outflow, 8-364
  - state named after, 8-198-A
- Minnetonka, Lake, Minn.,** 8-198
- Minnows, fishes,** 3-237, \*226
- Mino da Fiesole, *see* Fiesole, Mino da**
- Minoan civilization, *see* Crete, ancient**
- Minor scale, music,** 12-215
- Minorca, island, Mediterranean Sea**
  - map, 6-591
  - one of Balearic Islands, 6-471
- Minos, king of Crete**
  - Minotaur, 5-16, 17, †143; 14-447
  - palace of, *see* Cnossus
- Minotaur, monster, mythology,** 5-16, 17, †143; 14-447
- "Minstrelsy of the Scottish Border," by Sir Walter Scott,** 13-221
- Mint family,** 2-\*173, 175
  - condiments derived from, 9-311
- Minto, Gilbert John M. K. E., Earl of, reforms in India,** 5-386
- Minton porcelain works,** 12-61
- Mints, government coinage plants,** 7-507, 516
  - processes in U. S. mint, 7-\*503 fol., 377
- Minuend, mathematics,** 10-435
- Minuet, musical form,** 12-\*235, 236, 240
- Minuit, Peter, governor of New Netherland,** 8-272
  - Delaware settlement, 8-64, 66-A
- "Minuteman, The," statue by French,** 7-\*160
- Minutemen, in American colonies,** 7-164
  - monument to, 7-\*355
- Miocene period,** 3-51, 53, \*48
  - forms of life in, table, 3-64
  - rock formation, table, 1-\*40
- Miquelon, island, Gulf of St. Lawrence,** 7-33-N
- Mira, star, star map, Sept. and Oct.,** 1-178-I
- Mirabeau, Honoré Gabriel Riqueti, Count,** 6-191
- "Miracle of St. Hugo," painting by Zurbarán,** 11-\*252
- Miracle plays,** 12-326
- Miraflores Locks, Panama Canal,** 10-273

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Mirages**, cause of, 1-272, †424, 426; 5-453
- Miranda, Francisco de**, Venezuelan patriot, 5-504  
     birthplace, 5-517
- Miriam**, Hebrew leader, 5-120  
     song of, 12-†204
- Mirror galvanometer**, 13-391
- Mirrors**, 13-387  
     curved, 1-\*422, 429  
     Etruscan (bronze), 12-\*15, 18  
     glass, 12-28, 34, 38  
     Greek, 11-36  
     in thermos bottle, 1-400  
     painted with mercury, 9-416  
     polished-metal, 12-188  
     reflection of light, 1-†426 fol.  
     silver, 9-389  
     of Egypt, 12-\*80
- Mirrors, Hall of**, Palace of Versailles, 11-\*489  
     German emperor crowned in, 6-†231  
     treaty signed in, 6-239
- Misdemeanor**, defined, 7-388
- "Misérables, Les,"** by Hugo, 2-290, 13-126
- Misery, Mount**, St. Kitts Island, 7-63
- Mishna**, part of Talmud, 5-133
- Misquah Hills**, Minn., highest point, 8-190
- "Miss Lulu Bett,"** by Zona Gale, 13-350
- Missile, guided**, *see* Guided missile
- Mission Range**, mountains in Montana, 8-220
- Missionaries**  
     Africa, 5-480  
     Livingstone in Africa, 13-551  
     Dr. Bray's work establishing libraries, 10-556  
     China, 5-331  
     first sent to New World by Alexander VI, 5-137  
     Hawaii, 8-458  
     Indo-China, 5-429  
     Japan, 5-354  
     New Zealand, 5-534  
     Paraguay, 5-499  
     to the Indians  
         Father Peter John de Smet, 8-217  
         Franciscan, 7-434  
         Junipero Serra's work with Indians, 8-36  
         Jesuit, 5-499; 7-137; 13-†483  
         Spanish, 7-80, \*230, 232; 5-500; 11-†499
- Missions**, religious houses  
     California, 8-36, 37; 11-†499  
     demolished, 8-306  
     Indian, 8-306  
     Mexico, 7-80  
     Montana, 8-217  
     preserved in Tumacacari National Monument, 8-24-A  
     Spanish, in Texas, 8-378
- Mississippi**, state, U. S., **description and history**,  
     main article, 8-†200-5; general data, 8-206-206-A  
     agriculture, 8-202, †203  
     climate suited for, 8-302
- Mississippi**, agriculture—*continued*  
     growing season, 8-131  
     pecan industry, 8-\*203  
     area, 8-206  
     capital and capitol building, 8-\*200  
     charities and correction, 8-206  
     cities, towns, list, 8-205, 206-A  
     climate, 8-206  
     counties, list, 8-206-A  
     education, 8-205  
     educational institutions, list, 8-206  
     flag, 8-206-A  
     Glacial Age, 1-†61  
     history, 8-201-2  
         admitted to Union, 8-202  
         Civil War, 8-203  
     holidays, 8-206-A  
     Indians, 8-201, 202  
         reservations, 8-206-A  
     interesting facts, 8-206-A  
     location, 8-206  
     map, 8-512  
         on United States map, 7-595  
     motto, 8-206-A  
     name, 8-206  
     nicknames, 8-206-A  
     parks, 8-206  
     physical features, 8-206, 200  
     political facts, 8-206  
     population; growth of, 8-202  
     products and industries, 8-†203-5; *see also*  
         agriculture *above*  
     rivers, 8-206, 200  
     state bird, 8-206-A  
     state flower, 8-206-A  
     state song, 8-206-A  
     transportation, 8-202, 205  
     **"Mississippi,"** song, 8-206-A
- Mississippi embayment** of Gulf coastal plain, 7-343-C; 8-200  
     Kentucky, 8-138-A  
     Tennessee, 8-373
- Mississippi River**, U. S., from divide few miles South of Lake Hasca, Minn., to Gulf of Mexico, 7-213-14  
     alluvial soil deposited by, 1-97  
     amount of sediment carried, 1-49; 10-542  
     Arkansas, 8-30-A  
     basin area, 10-257  
     button factories, 9-51  
     Civil War campaigns in Mississippi region, 7-260, 261, \*262  
     color, 8-359  
     dam at Keokuk, 8-124  
     De Soto's discovery of, 13-\*464, 466  
     during Ice Age, 1-60  
     earthquakes in region of, 1-81  
     explorations, 7-137  
         La Salle, 13-486, 7-138  
         Marquette and Joliet, 13-†483, 484  
     fishing, 9-366  
     fresh-water clams, 9-\*52

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Mississippi River—continued**

- Illinois, 8-106
- importance to young states, 7-177, 206, 213
- Iowa, 8-124
- junction of Wisconsin and, 8-439
- Kentucky, 8-206
- length, 8-206
- Louisiana, 8-146
- map, 7-595
- Minnesota, 8-198
- Mississippi, 8-138-A, 200
- Missouri, 8-212-A
- name, origin, 8-206
- names given to, 7-213
- purification of water from, 10-542
- source, 8-198
- source of power, 9-236
- state named after, 8-206
- steamboat travel, 7-214, \*218, \*247; 8-441
- Tennessee, 8-373
- transportation on, 8-140
- tributaries, 7-343-C; 8-446
- Wisconsin, 8-446
- Mississippi Sound, U. S., 8-200**
- Mississippi Valley, U. S.**
  - Artesian well, 1-90
  - claimed for Louis XIV, 13-†485
  - Indian burial mounds, 7-†96
  - spring floods, 1-407
- Mississippian period, geology, 1-40**
- Missoula, Montana, 8-219**
  - university, 8-\*216
- Missoula River, Montana, 8-220**
- "Missouri," etymology of word, 8-212-B**
- Missouri, state, U. S., description and history,**
  - main article, 8-†207-12; general data, 8-212-A 213
  - agriculture, 8-210
  - area, 8-212-A
  - capital and capitol building, 8-\*207
  - charities and correction, list, 8-212-A
  - cities, towns, list, 8-212, 212-B
  - climate, 8-212-A
  - counties, list, 8-212-B
  - education, 8-212
    - institutions for the promotion of the arts, list, 8-212-A
    - institutions of higher learning, list, 8-212-A
  - flag, 8-212-B
  - Glacial Age, 1-†61
  - history, 8-208-11
    - admitted to Union, 8-210
    - Civil War, 8-211
    - controversy over admission to Union, 8-209; 7-218
    - part in slavery controversy of Kansas, 8-128
  - holidays, 8-212-B
  - Indians, 8-208
  - location, 8-212-A
  - map, 8-515
    - on United States map, 7-595
  - motto, 8-212-B

**Missouri, state, U. S.—continued**

- name, 8-212-B
- New Madrid earthquake, 1-81
- nicknames, 8-212-B
- physical features, 8-212-A, 207
- political facts, 8-212-A
- population, growth of, 8-211
- products and industries, 8-210, 211-12
- rivers, 8-212-A
- slavery, 8-209
- state bird, 8-212-B
- state flower, 8-212-B
- state song, 8-212-B
- trade, 8-210
- transportation, 8-212
- Missouri Territory of, 8-209**
  - Arkansas becomes separate territory, 8-28
- Missouri, University of, 8-208, \*208**
- Missouri Compromise, 8-209**
  - repealed, 7-248
- Missouri Day, holiday, 8-212-B**
- Missouri Indians, 7-†103; 8-317**
- Missouri Plateau, U. S., 8-302**
- Missouri River, U. S.**
  - basin, 8-216
  - color, 8-359
  - first steamboat, 8-36
  - Fort Peck Dam, 8-220-A
  - fishing, 9-366
  - importance of; peopling of its valley, 7-213
  - Iowa, 8-124
  - Kansas, 8-131
  - map, 7-594
  - name, 8-212-B
  - Nebraska, 8-228
    - tributaries, 8-222
  - nicknamed the "Big Muddy," 8-502-A; 10-542
  - North Dakota, 8-302
  - sapphires found in sand bars, 9-433
  - South Dakota, 8-364
- "Missouri State Song," 8-212-B**
- Missouri Territory, 8-209**
  - Nebraska part of, 8-224
- "Missouri," U. S. battleship, 7-485; 10-\*348, \*269; 12-\*555-I**
- Misti, Mount, Peruvian volcano, 5-\*507**
- Mistletoe, a partial parasite, 2-†56**
- Mistletoe feast of Druids, 6-\*6**
- Mistral, wind, 1-231**
- "Mistress Silence Dogood" (Benjamin Franklin), 12-463, 464**
- Mitchell, William ("Billy"), aviator, 7-479-F**
- Mitchell, Mount, North Carolina, height, 8-291**
- Mite, animalcule of spider family, 3-406, 413**
- Mithras, Persian spirit of good, 5-102**
- Mitosis, cell division, 2-\*279, 280**
- Mitre, Bartolomé, president of Argentine Republic, 5-514**
- Mitre Tavern, 13-\*192**
- Mitsuoki, Japanese artist, 5-359**
- Miwok Indian, boat, 10-\*136**
- Mixed bud, botany, 2-133**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Mizar**, star, star map, May and June, 1-178-E  
**Mizzen royal**, sail, 10-\*171  
**Mizzen-royal staysail**, 10-\*171  
**Mizzen sail**, 10-\*171  
**Mizzen skysail**, 10-\*171  
**Mizzen staysail**, 10-\*171  
**Mizzen topgallant staysail**, 10-\*171  
**Mizzen topmast staysail**, 10-\*171  
**Mnaidra**, temple of, Malta, 6-\*475  
**Mnemosyne**, goddess, 14-411  
**Moa**, bird, 4-233, 237  
     giant egg, 4-\*237  
     found in New Zealand, 5-532  
**Moab**, ancient people, Palestine, 5-124  
**Moabite stone**, 5-125; 10-\*42  
**Moats**, 5-†304; 10-356, \*361  
     tennis played in, 14-466  
**Mobile**, Ala.  
     descended from Fort Conde, 8-4  
     docks, 8-\*3  
     fishing, 8-7  
     temperature, 8-8  
**Mobile, Battle of**, 7-264  
**Mobile Bay**, Ala., 8-2  
**Mobile River**, Ala., 8-3, 8  
**"Moby Dick,"** by Herman Melville, 9-365;  
     13-324  
**Moccasin**, snake, 3-492, \*501  
**Moccasins**, Indian, 9-56, \*60  
**Mocha coffee**, 9-130; 5-398  
**Mock suns**, 1-272  
**Mocking bird**, 4-†133-35  
     Mississippi's state bird, 8-206-A  
     nest building and breeding, 4-134-35  
     song compared with nightingale's, 4-170  
     Tennessee's state bird, 8-374  
     Texas's state bird, 8-386-A  
**Model Parliament**, 6-25  
**Modeling of clay**, 14-†57  
**Models**, wooden, how to make, 14-†34  
**"Modern American Poetry,"** anthology of  
     Louis Untermeyer, 13-348  
**"Modern British Poetry,"** anthology of Louis  
     Untermeyer, 13-348  
**"Modern Instance, A,"** by William Dean  
     Howells, 13-332  
**"Modern Love,"** by George Meredith, 13-263  
**Modern Mother of Presidents** (Ohio), 8-312-B  
**"Modern Painters,"** by John Ruskin, 13-237  
**Modern Period**  
     "Age of Reason," 5-209  
     freedom of thought fought for, 5-284  
     highly advanced before World War I, 7-304-5  
     *see also* Machine Age; Modernist art  
**Modernist art**  
     cubism, 11-\*388, 391  
     impressionism, 11-344-48  
     internationalism, 11-392  
     post-impressionism, 11-380  
     primitive art copied by artists, 12-96  
**Modernist poets**, 13-353  
**Modernistic art**, game, 14-150  
**Modernistic furniture**, 12-\*174, \*175, †199  
**Modes**, musical scales  
     Greek, 12-206-8, 211  
     Gregorian, 12-212  
**Modoc Indians**, in Oregon, 8-328  
**Modred**, Sir, in Arthurian romances, 14-382, 400  
**Modulator**, radio, 10-121-L  
**Moffat**, Robert, 13-552  
**Moffat tunnel**, 10-206  
**Moghulistan** (Eastern Turkestan), 5-436  
**Mogollon Mesa**, Ariz., 8-24  
**Mogul empire**, India, 5-374-75, 378-80  
**Mohacs**, Battle of, 6-281  
**Mohammed**, Arabian prophet, life, main article,  
     13-†521-23  
     and the Jews, 5-134  
     hegira from Mecca, 13-523  
     portrait, 13-\*522  
     regarded as greatest of prophets by followers,  
         5-422, 423  
     teachings, 13-522; 5-396  
     warns against laying up gold, 12-56  
     *see also* Mohammedans and Mohammedanism  
**Mohammed II**, the Great, sultan of Turkey  
     captures Constantinople, 5-411  
     portrait by Gentile Bellini, 11-\*173  
     star and crescent adopted by, 14-573  
**Mohammed Ali**, the Mahdi, captures Khar-  
     toun, 5-455  
**Mohammed Ibn Raschid**, suppresses Wahhabis,  
     5-401  
**Mohammed Ibn Saud**, conquers in Arabia, 5-399  
**Mohammed Ibn Wahhab**, founds Wahhabism,  
     5-399  
**"Mohammed Teaching,"** painting, 13-\*521  
**Mohammedans and Mohammedanism (Islam)**,  
     main article, 5-†416-23  
     Africa, 5-451, 454, 458, 472, 473-B  
     Arabia, 5-†396-98, †416-23; 13-522  
     architecture, 11-†449-51, †453  
         Kabul, entrance to mosque, 5-\*433  
         *see also* Architecture, Moorish  
     art, 12-56; 11-242  
     mosaic work, 12-112  
     pottery, 12-56  
     attitude toward children, 5-423  
     Baghdad capital of, 5-398  
     Balkans, 6-357, 364, 366  
     beginnings and early history in Arabia, 5-  
         280, †396-98  
     caliph the head of church and state, 5-423  
         *see also* Caliphate  
     call to prayer, 5-†418; 13-521  
     capitals of, 5-398  
     Central Asia, 5-434 fol.  
     Ceylon, 5-387-B  
     China, 5-325  
     coffee used as stimulant, 9-129  
     Constantinople threatened by, 5-406, 408  
     crescent emblem of, 5-397  
     Crcte, 6-478  
     deposit shoes at door, 9-56

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Mohammedans** —*continued*

education, 5-419, 423  
 Egypt, 5-\*66, \*71, 73  
 Europe, *see* Moors  
 Europe, today, 6-162-1D  
 forbidden to reproduce human figure, 11-242  
 founded by Mohammed, 13-521  
 Hebrew Bible and prophets revered, 5-422  
 holy wars on infidels, 5-423  
 India, 5-372, 378, 387  
 Koran, *see* Koran  
 life and customs, 5-418, 423  
 Malaya, 5-426  
 Mecca, *see* Mecca  
 monks, 5-108  
 mosques, *see* Mosques  
 Pacific islands, 5-523  
 people and lands of Islam, a pilgrimage to Mecca, 5-†416-23  
 Persia, 5-105  
 Philippines, 5-562, 563  
 prayer and grave rugs, 5-†417; 12-148, \*149  
 relations with Christians and Jews, 5-280-81, 134  
 religion a Semitic product, 5-44  
 Saracens, 5-251, \*282  
   in Song of Roland, 14-†337-42  
 slave market, 5-\*408  
 Spain, 6-320  
 spreads into Palestine, 5-280  
 teachings, 5-396, 13-522  
 territorial extent, 5-397  
 time reckoned from hegira of Mohammed, 13-523  
 treatment of women, 5-419  
 use of alcohol forbidden, 5-418  
 Wahhabis, 5-399  
 "Wailing Wall," Jerusalem, owned by, 5-131  
*see also* Crusades; Turks  
**Mohave Desert**, Calif., 8-42  
**Mohawk Indians**, 8-269; 7-†107; 9-\*94  
   Vermont, 8-400  
**Mohawk River**, New York State, 8-283  
**Mohawk Valley**, N. Y., 8-283  
**Mohegan Indians**, *see* Mohican  
**Mohican Indians**  
   territory occupied, 8-270, 400  
**Moisture in atmosphere**, 1-219, †239-42  
   effect on plants, 2-46, 193, 197  
**Molars**, teeth, 2-\*314, 315  
**Molasses**, 9-116  
   iron in, 9-408  
   made from millet, 9-120  
   pumps used for, 1-465  
**Mold**, fungus  
   bread, 2-†74  
   cheese made with, 2-76  
   slime, 2-\*75  
**Moldau**, river, Czechoslovakia, 6-290-A  
**Mole crab**, 3-180  
**Mole cricket**, 3-349, \*345  
**Mole shrew**, 4-278

**Molecules**, main article, 1-†354-61, 499  
   action of, 1-2  
   arrangement, 1-361, †380  
   attraction, 1-2  
   defined, 1-283  
   difference between atoms and, 1-357  
   formation from atoms, 1-†543-45  
   measurement of speed, 1-389, 390  
   movement, 1-357-59, \*403, †404, 405  
     affected by heat, 1-†379-86  
   size, 1-\*280  
   temperature determined by rate of motion of, 1-388  
**Moles**, animals, 4-†276-79  
**Molière (Jean Baptiste Poquelin)**, life and work, main article, 13-†110-12  
   characters taken from Italian comedy, 12-329  
   contemporaries, 12-412  
   portrait, 13-\*110  
   relations with Racine, 13-113  
**Moline**, Ill., industries, 8-104  
**Molko**, Solomon, 5-138  
**"Moll Flanders, The Fortunes and Misfortunes of,"** by Daniel Defoe, 13-177  
**Mollusks**  
   bivalve sea mollusks, 3-†151-60  
   mussel  
     fresh-water, 3-260-62  
     sea, 3-156  
   octopus, squid, and cuttlefish, 3-†166-72  
   oyster  
     fresh-water, 3-262  
     sea, 3-157, \*69  
   prehistoric, 3-9, 15, 18, 24, 64  
   univalve sea mollusks, 3-†141-49  
   water snails, 3-147, †258-60  
**Mollymauks**, birds, 4-217  
**Moloch**, Ammonite god, worship of, 10-334  
**Molokai**, island of Hawaiian group, 8-461  
   map, 8-562  
**Molotov, Vyacheslav M.**, biography, 6-567  
**Molting**  
   amphibians, 3-416  
   crustaceans, 3-178, 186, 190  
   insects, 3-277, 280, \*347, †348, †373, 388, †389  
     fol.  
   snakes, 3-483, \*484  
   spiders, 3-406  
**Moltke**, Count, Danish statesman, 6-415  
**Molucca Sea**, East Indies, map, 5-597  
**Moluccas (Spice Islands)**, East Indies, 5-529-B  
   cloves grown in, 9-208  
   discovery, 5-545  
   maps, 5-597, 581  
**Molybdenum**, element, symbol, atomic no. and wt., 1-\*551  
   use, 8-50; 9-403  
**Momentum**, defined, 1-297  
**Mona (Anglesey)**, island, Wales, 6-137  
**"Mona Lisa,"** painting by Leonardo da Vinci, 11-†154, 156  
**Mona monkey**, 4-253

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Monaco**, principality of, Europe, description, 6-466-67  
 flag, color plate, 14-following 570, no. 35  
 map, 6-581  
 Monte Carlo, 6-467
- Monadnock**, in physiography, 8-149
- Monadnock, Mt.**, peak, New Hampshire, 8-237  
 painting, 11-361
- Monads**, universal substance, in philosophy of Leibnitz, 13-15
- Monarch butterfly**, 3-\*276, color plate, \*278  
 egg, 3-\*274  
 life cycle, 3-\*278  
 migration; numbers, 3-282  
 protective device, 3-284  
 taste for milkweed, 3-276
- Monarchy**  
 absolute, 6-342; 7-347  
 constitutional, 6-333
- Monasteries**, *see* Monks and monasticism
- Monastery**, 11-105  
 Burgundian sculptures, 11-\*92, 103
- Monasticism**, *see* Monks and monasticism
- Monday**, origin of name, 10-483
- Monet, Claude**, paintings by, 11-†344-49  
 "Houses of Parliament," 11-\*346
- Money, history and use of**, main article, 7-†501-8  
 American denominations, 10-375  
 and capital, 7-537  
 as measurement of capital and wealth, 7-587  
 British, 9-390  
   coinage brought to standard by Elizabeth, 6-53  
 cattle and sheep used as, 7-503, 506  
 Chinese, 7-†507  
 effect of gold supply upon, 7-513  
 free coinage of silver, 7-292  
 gold standard invented by Chinese, 7-507  
 inflation of currency, 7-508  
 Italian lira, 6-312, 314  
 Massachusetts Bay Colony coins, 8-171  
 Mongolian, 5-438  
 paper money, 7-†507-8  
   burning old bills, 7-\*505  
   greenbacks, 7-292  
   inflation, 7-508  
   issued by federal Congress, 7-167, 362  
   panic of 1837, 7-227  
   printing, 7-\*506  
 Spartan, 5-155  
 transferred by armored cars, 7-\*519  
 value affected by prices and wages, 7-546  
 why gold is used for, 7-506  
*see also* Coins and coinage
- Money interests**, name for capitalists, 7-288
- Money lenders**, Jewish, 5-135
- Mongolia**, region, Asia, description and history, 5-†437, 438  
 animal life: Mongolian wild horse, 4-\*349, \*350  
 costume, 9-\*37
- Mongolia—continued**  
 map, 5-590  
 movable villages, 5-\*436
- Mongolian Plateau**, Asia, 5-336-B
- Mongolian (yellow) race**, 5-†43  
 Africa, 5-445  
 Asia, 5-336 C  
 China, 5-336-A  
 Europe, 5-270  
 Japan, 5-364-B  
 migration into Alaska, 8-10  
 possible settlement in Mexico, 7-68  
 Russia (Mongoloids), 6-443-A
- Mongolian Turks**, *see* Turks
- Mongolian wild horse** (Przevalsky's horse), 4-\*349, \*350
- Mongols**, Asiatic people, life and customs, 5-\*436, †437  
 China: invasion and rule, 5-327  
   Manchus, 5-330  
 Finns related to, 6-456  
 first horsemen, 4-510  
 Lapps related to, 6-\*380  
 medieval Europe, 5-270, 294  
 Russia: invasion and conquest, 6-425; 5-403  
 Russia of today, 6-443-A  
*see also* Huns; Magyars; Tatars
- Mongoose**, animal, 4-296  
 snakes exterminated by, 3-486, \*487; 7-66
- Mongrel dog**, 4-503
- Monhegan Island**, early settlers, 8-151, 152
- Monica, Saint**, 13-\*531, 532, 533
- Monitor**, lizard, 3-\*455, 460, 463  
 "Monitor," warship, 13-†439, 440  
 battle with "Merrimac," 10-†360; 13-†439; 7-\*259
- Monkey bread tree**, plant found in Africa, 5-473-B
- Monkey-faced (barn) owl**, 4-\*164, 165, 166
- Monkey-puzzle**, tree, 2-258  
 in Carboniferous period, 3-29
- Monkeys**, main article, 4-†241-67  
 African and Asiatic monkeys, 4-†251-60, †267-69  
 American monkeys, 4-†262-67  
 apes, 4-†241-49  
 compared with apes, 4-251  
 difference between those of America and Old World, 4-252, 262  
 head compared with man's, 2-319  
 how skeleton differs from man's, 2-319, 320  
 in zoos, 4-476, \*478, \*480, \*481  
 nest built by mouse lemur, 4-269  
 sacred, 4-†255, 259
- Monkfish**, 3-201, \*206
- Monks and monasticism**, 5-†278, 308; 11-477  
 abbeys, 11-87  
 agriculture, 7-451  
 asceticism, 5-278  
 beginning in Egypt, 5-278  
 Buddhist, 5-370  
 lamas, 5-437, 440

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Monks and Monasticism**—*continued*

- California missions, 8-36
- civilizing influence in Middle Ages, 5-271
  - teaching done through art, 11-88
- cloister, 11-477
- England; abbeys, 5-278
- furniture made by, 12-182
- goldsmithery, 12-86
- Henry the VIIIth dissolves monasteries, 6-45, 152; 12-392
  - beggars increased as result, 6-54
- Irish monasteries, 6-145; 11-84
  - dissolution, 6-152
- life in monasteries: daily routine, 5-278, 308
  - books copied and illuminated, 11-†84; 10-\*12, \*34, \*35
  - painting; Fra Angelico, 5-†279, 11-134
- Luther becomes, 13-542
  - excommunication from church, 13-543
- monasteries, 5-†308; 11-477
  - architectural plan, 11-477
  - defense, 11-477
  - ironwork used by, 12-8
- orders in Middle Ages, 5-278
  - Augustinian, 5-278; 13-533
  - friars, 5-277
  - Jesuits founded by Loyola, 13-545; *see also* Jesuits
- Peter the Hermit and crusades, 5-\*280, 282
- protected by feudal lords, 7-352
- road building, 10-151

**Monkshood**, aconite derived from, 9-219**Monmouth, James Scott, Duke of**, rebellion, 13-175

begs mercy from James II, 6-\*68

**Monmouth, Battle of**, 12-454

Molly Pitcher's part in, 12-492-93

**Monocacy**, battlefield, Maryland, 8-162-A**Monocacy River**, Maryland, length, 8-162-A**Monocotyledons**, plants, main article, 2-†143-52

characteristics; three main groups, 2-144

definition, 2-129

pollination, 2-144, 148

venation, 2-25

**Monograms**, how to make, 14-†75**Monolith**, Mayan, 7-\*42**Monongahela River**, U. S., 8-341

West Virginia, 8-436-A

**Monoplanes**, 10-328-K**Monopoly**

- and competition, 7-539, 541
- dangers to consumer, 7-543
- government control and ownership, 7-543
- medieval guilds, 5-310
- natural monopolies, 7-541, 542
- patents, 7-381

**Monorail car**, 1-\*291**Monosaur**, prehistoric animal, 3-\*41**Monotheism**, belief in one god, 5-273

basis of three great religions, 5-280

Greek philosophers, 13-6, 12

**Monotheism**—*continued*

Ikhnaton's attempt to establish in Egypt, 5-64

Jewish belief in one God, 5-120, 132

Mohammed teaches, 13-522; 5-396

**Monotype**, typesetting machine, 10-†55, 60**Monroe, Elizabeth Kortright** (Mrs. James Monroe), 12-562**Monroe, Harriet**, magazine founded, 13-347**Monroe, James**, president of the U. S., 12-456-D

administration, 7-216, \*217

arranges annexation of Florida, 7-216

arranges Louisiana Purchase, 7-206, 217

formulates Monroe Doctrine, 5-506; 7-211

portrait, 7-\*217

**Monroe, Fort or Fortress**, Va., 8-416**Monroe Doctrine**, 12-456-D; 5-506; 7-211

applied in Venezuela boundary dispute, 7-290

applied to Mexico, 7-86

disputes caused by, 5-517

resented in South America, 5-518

**Monroe Palace**, Rio de Janeiro, 5-\*515**Mons-en-Puelle, Battle of**, 6-\*171**Monsoons**, seasonal winds, 1-231; 5-425

Dutch East Indies, 5-529-B

India, 5-387-A

Russia, 6-443-A

Siam, 5-430-A

**Monstera**, plant, 2-\*260**Monsters**

dragons in Chinese mythology, 5-313

Greek myths about, 14-†419-21, †443-48

overcome by Hercules, 14-†426-30

**Mont Blanc**, *see* Blanc**Mont Cervin**, *see* Matterhorn**Mont-Royal**, *see* Montreal**Montagu, Lady Mary Wortley**

and Alexander Pope, 13-\*183, 184

inoculation of smallpox introduced into England by, 13-365

opinion of Richardson's novels, 13-187

**Montaigne, Michel de**, life and work, main

article, 13-106-7

philosophy, 13-109

portrait, 13-\*106

**Montalvo, Garcé Rodriguez de**, writer, and name of "California," 8-34 42-B**Montana**, section of Peru, 5-518-D**"Montana,"** etymology, 8-220-A**Montana**, state, U. S., description and history, main article, 8-†214-22; general data, 8-220-220-B

agriculture, 8-219

area, 8-220

capitol, 8-\*215

charities and correction, list, 8-220

cities, towns, list, 8-218, 219, 220-B

counties, list, 8-220-B

education, 8-219

institutions of higher learning list, 8-220

elevation, 8-216

flag, 8-220-A

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Montana, state, U. S.—continued**

- fur traders, 8-217
- Glacier National Park, 7-\*406, 407
- harvest scene, 10-\*409
- history, 8-216
  - included in Idaho territory, 8-89
- holidays, 8-220-A
- Indians, 7-280; 8-216, 217
  - reservations, 8-220-A
- interesting facts, 8-220-A
- location, 8-220
- map, 8-516
  - on United States map, 7-594
- monuments, 8-220-A
- motto, 8-220-A
- name, 8-220-A
- nicknames, 8-220-A
- parks, 8-220-A
- physical features, 8-220, 215
- political facts, 8-220
- products and industries, 8-†218
  - mining, 8-\*217, 218; 9-\*416
- reservations, game and bird, 8-220-A
- rivers, 8-220, 216
- state bird, 8-220-A
- state flower, 8-220-A
- state song, 8-220-A
- transportation, 8-218, 219
- "Montana," song, 8-220-A
- Montana, University of**, Missoula, 8-\*216
- "**Montani Semper Liberi**," motto of West Virginia, 8-436-B
- Montcalm de Saint-Véran, Louis Joseph**
  - at Heights of Abraham, 7-143
  - monument at Quebec, 7-142
- Montcorbier, François de**, *see* Villon, François
- Monte Carlo**, capital of Monaco, 6-467, \*469
- Monte Rosa**, mountain peak of Alps, 6-162-C
- Montenegro**, former kingdom, 6-364, \*365
- Monterey, Calif.**
  - Commodore Sloat's capture, 8-37, \*38
  - first Mass, 7-230
- Monterey, Battle of**, Grant's part in, 12-533
- Monteverde, Claudio**, "Orfeo"; music of, 12-223
- Montevideo, Uruguay**, 5-518-G
  - rainfall and temperature, 5-518-G
- Montezuma II**, Aztec chieftain, and Cortes, 2-296-97; 7-74-76
- Montezuma Castle, Arizona**, 7-\*417
- Montezuma Castle National Monument, Ariz.**, 8-24-A
- Montferrat, Duke of**, murder of, 12-373
- Montfort, Simon de**, governs England, 6-25
- Montgolfier brothers**, balloon built by, 1-467, 473; 10-314, \*319
- Montgomery, Sir Bernard L.**, British field marshal, 6-549, 550; 12-\*555-G
  - biography, 6-567
- Montgomery, James**, 8-132
- Montgomery, Lucy Maud**, Canadian author, 7-29-I
- Montgomery, Richard**, leads attacks at Montreal

- and Quebec, 7-11
- Montgomery, Ala.**, capital, 8-1
  - capitol building, 8-\*1
  - center of Confederacy, 8-6
- Month**, period of time, 1-100
- Months**, how calculated, 10-477-78, 480-83
  - early names for, 10-480
  - origin of name from moon, 10-478
  - origin of present names, 10-482
  - pictured in early Flemish paintings, 11-\*190, †192, 203
    - rhyme for remembering days in, 10-482
- Monticello**, Charlottesville, Va., Thomas Jefferson's home, 11-508, \*514; 12-\*503, 505
- Montpelier, Vermont**, 8-†398
- Montreal, Canada**, 7-29-Q-29-R, \*29-P, 33-B
  - captured by Montgomery, 7-11
  - Cartier's visit to village on site of, 13-474
  - city government, 7-33-L
  - named by Cartier, 7-135
  - rival of Albany in fur trade, 7-7
  - temperature, 7-33-A
- Monts, Sieur de**, in New World, 8-151
- Montserrat**, island, West Indies, 7-63
- Monumental State**, nickname for Md., 8-162-B
- Moodie, Susanna**, Canadian author, 7-29-I
- Moody, Helen Wills**, 14-466
- Moody, William Vaughan**, author, 13-354
- Moon**, of earth, main articles, 1-†120-43
  - age, 1-43
  - atmospheric conditions, 1-138
  - cause of its light, 1-\*122, 123, \*136
  - distance from earth, 1-123
  - eclipse of, 1-125, †126, \*136
  - eclipse of sun caused by, 1-\*108, 117
  - formation of: landscape, 1-131, †139 fol.
  - gravitation, 1-133, 140 fol., \*301 fol.
  - movement with relation to the earth, 1-123, †124-25, \*129
  - path through space, 1-†125
  - phases, 1-120, \*124, †126-27
  - radar signals echoed from, 1-†568
  - shape, 1-132
  - size, 1-†123, 132
  - tides caused by, 1-133, \*135, \*137
  - trip to the moon, 1-136, †299-301
  - weather forecasting by, 1-133, 266
  - where and when it rises, 1-127, †128
  - worship of, and superstitions about, 1-121
- Moon** of finger nail, 2-\*290
- "**Moon Calf**," by Floyd Dell, 13-350
- Moon tag**, game, 14-167
- Moon time**, measuring and recording, 10-478, 480, 481
- Moonfish**, 3-\*212
- "**Moonlight Sonata**," by Beethoven, 12-279
- Moons of planets**, color plate, 1-98, 122
  - birth, 1-5, 6, 8
  - Jupiter, 1-155
  - Mars, 1-151
  - Neptune, 1-159
  - Saturn, 1-†156

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Moons of planets—continued**

Uranus, 1-158

*see also* Moon of earth**Moore, Thomas**, 6-158**Moore house**, Yorktown, Va., 7-412, \*413**Moore's Creek Bridge, Battle of**, 8-292**Moore's Creek National Military Park**, 8-296-A**Moorhens**, birds, 4-175**Moorish architecture**, 11-449, \*451; 6-\*321  
Arabia, 5-419**Moors**, Mohammedan people, 6-320, 322-23  
agriculture, 7-451

checked by Charlemagne, 12-369, 370

defeated at Tours, 6-167

descendants in the Sahara, 5-453

descendants oppressed by Philip II, 6-327

leather carving, 12-107

migration, 5-270

pattern art in Spain, 11-241, 242

Portugal, 6-338

steel needles introduced by, 9-408

traces left in Spain, 6-317

treatment of Jews, 5-134

**Moose**, animal, 4-†407-11, 402, \*421; 8-\*11**Moosehead Lake**, Maine, camping, 8-155  
length, 8-156**Moraine**, terminal, 8-439**"Moral Works,"** by Plutarch, 13-44**Morality play**, 12-327**Moran**, Edward

"Marine," painting by, 11-\*369

**Morant Cays**, West Indies, 7-54**Morat**, Switzerland, fortifications: battle, 6-\*247, 250**Morava**, or **March River**, forming boundary between Austria and Czechoslovakia, 6-265  
map, 6-586  
valley, 6-290-B**Morava-Vardar depression**, Yugoslavia, minerals, 6-290-B**Moravia**, division of Czechoslovakia, 6-290-A**Moravian peasant**, 6-\*359**Moravians**, religious sect, 8-306

Pennsylvania settled by, 8-335

**Moravians**, European people, invade German empire, 6-207**Moray Firth**, inlet, Scotland, map, 6-574**Morays** (painted eels), 3-\*99**Mordant**, dye "fixer," 9-306**More**, Anthony, Flemish painter, 11-202**More**, Margaret, 13-\*147**More**, Sir Thomas, life, main article, 13-†147-48  
Holbein's association with, 11-214  
portrait by Holbein, 11-\*213**Moreau (Owl) River**, S. D., 8-364**Morella**, fungus, 2-\*75, 76**Morelos**, state, Mexico, map, 7-597**Morelos-Pavón**, José María, part in Mexican revolt, 7-82**Morgan**, De Witt, Mrs., composer of "Mississippi," 8-206-A**Morgan**, John H., Confederate general, 8-113**Morgan**, John Pierpont, 7-282

aids government with gold, 7-290

called upon in economic crisis, 12-456-B

financial deals, 7-308

**Morgan**, Morgan ap, American settler in West Virginia, 8-431**Morgan**, William, and Welsh Bible, 6-140**Morgan le Fay**, fairy, 1-425**Morgantown**, W. Va., university,\*8-431**Morgarten**, Battle of, 6-248**Moriscos**, remnant of Moors in Spain, oppressed by Philip II, 6-327**Morland**, George, animal paintings, 11-\*311**Morley**, Thomas, 12-222**Mormon State**, 8-396A**Mormons (Latter Day Saints)**, 8-99, 392-93

fort preserved in Arizona, 8-24-A

modern, percentage of, 8-396-A

persecution in Independence, 8-211

settlement at Salt Lake City, 7-243, †244

temple and tabernacle, Salt Lake City, 8-\*390

**"Mormons,"** nickname for people of Utah, 8-396-A**"Morning,"** painting by Corot, 11-\*327**Morning-glory**, related to sweet potato, 9-145**Morning-glory family**, 2-†171, 174**Morning star**, 1-146**Mornington**, Lord, *see* Wellesley, Richard Colley Wellesley, marquis**Moro Gulf**, Philippine Islands, map, 5-595**Morocco**, country, Africa, 5-455, general data, 5-473-C

agriculture, 5-455

area, 5-473-C

Ceuta (port) taken by Portuguese naval forces, 6-340

climate, 5-473-C

division of Barbary Coast, 5-451

Franco-German dispute, 6-234

government, 5-473-C

leather, 9-72

location, 5-473-C

map, 5-574

minerals, 5-473-C

mountains, 5-452

native life, 5-\*450, 452, \*454

people, 5-473-C

physical features, 5-473-C

Spanish campaign, 6-335

**Morocco leather**, 9-72**Moros**, people, in Philippines, 5-†562 fol., 570**Morpheus**, god, morphine named for, 9-218**Morphine**, 9-218

smuggling of, 7-\*513

**Morphological botany**, 2-3**Morphy**, Paul, chess champion, 14-489**Morrill Act**, 7-456**Morris**, Etta, H., song by, 8-284-A**Morris**, George Pope, American poet  
poem by, 8-212-B

quotation from poem, 8-138-B

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Morris, Gouverneur**, American statesman, 12-\*496
- Morris, William**, English craftsman and printer, 11-320  
furniture by, 12-196  
revives printing as an art, 10-66  
stained glass by, 12-77  
tapestry establishment, 12-144
- Morristown, N. J.**, historical spots, 7-412  
Washington's headquarters, 7-\*413
- Morristown National Historical Park**, 7-412; 8-252-A
- Morse, Joel**, modern plow, 7-452
- Morse, Samuel F. B.**, inventor, 10-†94-99  
portraits, 10-\*95, \*101  
statue, 10-\*102
- Morse code**, 10-†97  
use in radio, 10-116, 118
- Mortar**, cannon, 10-368
- Mortar and pestle**, 9-233  
used by American Indians, 9-239  
used by Mexican peons, 7-\*81
- "Morte d'Arthur,"** by Sir Thomas Malory, 13-145, 146  
printed by Caxton, 10-54
- Mortlake**, London, tapestry works, 12-144
- Morton, J. Sterling**, Arbor Day originated by, 14-583
- Morton, John**, and Henry VII, 6-42
- Morton, John**, Pennsylvania representative, 8-342
- Morton, Levi P.**, vice president of the United States, 12-456-G
- Morton, Oliver P.**, governor of Indiana, 8-113  
"Morton's fork," 6-43
- Mosaic plate**, in television transmitter, 10-\*125
- Mosaics**, main article, 12-†109-15  
Byzantine, 11-79, 446, 447, \*448; 12-112  
attempts at restoration, 12-115  
Ravenna, 11-80  
St. Mark's, Venice, 12-\*111, 112; 11-\*78  
early Christian, 11-†77-78  
glass, 12-71, 111, 112, 115; 11-77  
Greek and Roman pavements, 12-†110, 115  
how made, 12-†109 fol.  
modern, 12-114  
Mohammedan, 12-112  
Pompeian, 11-53  
wall decoration, 12-112  
wood, 12-114
- Moscheles, Ignaz**, 12-320
- Moschus**, Greek poet, 9-70
- Moscow**, Idaho, educational institutions,\* 8-87
- Moscow**, city, U.S.S.R., 10-263  
burned by Russians, 6-435  
free cities absorbed by, 6-427  
Krenilin, 12-\*449-D  
map, 6-600, F3  
rise of, 6-426  
theater, 12-333, 334
- Moscow Art Theater**, 12-333  
Chekhov the playwright for, 13-96
- Moscow Guard**, reviewed, 6-\*545
- Moses**, biblical character, 5-119  
found by Pharaoh's daughter, 5-\*119  
meaning of name, 5-119  
sacred ark built by, 5-123  
statue by Michelangelo, 11-\*155, 162; 12-\*95  
statue with horns, 11-\*103, 105
- Moses, Law of**, 5-119 fol., 133, 137, 138
- Moses of the Negro race** (Booker T. Washington), 12-570
- Moslems**, *see* Mohammedans and Mohammedanism
- Mosques**, Mohammedan churches, description of, 5-418, †419  
Damascus, 5-\*108  
Great Mosque, Cordova, 6-\*321  
Great Mosque, Mecca, 5-121, †422  
in life of Mohammedans, 5-423  
Jama Masjid, Delhi, 5-\*377  
Rani Sipri, Ahmedabad, India, 5-\*380  
St. Sophia, *see* St. Sophia  
Sultan Ahmed's at Constantinople, 5-\*403
- Mosquito Coast**, Nicaragua, 7-48-B
- Mosquito Gulf**, Central Amer., map, 7-599
- Mosquito State**, nickname for New Jersey, 8-252-A
- Mosquitoes**, 3-360, †362, \*363  
life cycle, 3-360, \*363  
malaria caused by, 9-217  
Panama, 10-270  
proved to be cause of yellow fever, 2-388
- Moss animals (sea moss)**, 3-\*105, †114-15
- Mosses**, main article, 2-†82-85  
Carboniferous period, 3-29  
life cycle, 2-\*83  
position on trees, 14-567  
reindeer moss, 4-412  
reproduction, 2-†83-85, 88, †89  
*see also* Club mosses
- "Mosses from an Old Manse,"** by Nathaniel Hawthorne, 13-300  
house in which written, 13-\*304
- Mosul**, city of Northern Mesopotamia on the Tigris River  
map, 5-582, E3  
oil deposits, 10-262
- Moth**, *see* Moths
- Moth balls**, made from coal tar, 9-445
- "Mother and Boy,"** painting by Mary Cassatt, 11-\*357
- "Mother and Child"**  
painting, by George De Forest Brush, 11-\*356  
painting, by Mary Cassatt, 11-\*357  
*see also* Madonna in art
- "Mother and Son,"** painting by Thomas Sully, 11-\*367
- Mother Carey's chicken** (petrel), 4-217
- "Mother Goose,"** nursery rhymes, color plates, 14-174-B-174-L  
"A Man of Thessaly," color plate, 14-174-D  
"Barber, Barber, Shave a Pig," color plate, 14-174-D

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

**"Mother Goose"—continued**

- "Bye, Baby Bunting," color plate, 14-174-F  
 "Cat and the Fiddle," color plate, 14-174-F  
 "Fiddle-dee-dee," color plate, 14-174-D  
 "Goosey, Goosey, Gander," color plate, 14-174-C  
 "Hickety, Pickety," color plate, 14-174-D  
 "Hickory, Dickory, Dock," color plate, 14-174-F  
 "Humpty Dumpty," color plate, 14-174-I  
 "Jack and Jill," color plate, 14-174-K  
 "Jack Sprat," color plate, 14-174-H  
 "Little Bo-Peep Has Lost Her Sheep," color plate, 14-174-E  
 "Little Boy Blue," color plate, 14-174-K  
 "Little Jack Horner," color plate, 14-174-F  
 "Little Miss Muffet," color plate, 14-174-I  
 "Mary Had a Little Lamb," color plate, 14-174-G  
 "Old King Cole," color plate, 14-174-J  
 "Old Mother Hubbard," color plate, 14-174-I  
 "Peter Piper," color plate, 14-174-H  
 "Peter, the Pumpkin Eater," color plate, 14-174-F  
 "Simple Simon," color plate, 14-174-I  
 "Sing a Song of Sixpence," color plate, 14-174-C  
 "There Was an Old Woman," 14-174-J  
 "This Little Pig Went to Market," color plate, 14-174-H  
 "Three Blind Mice," color plate, 14-174-K  
 "Three Wise Men of Gotham," color plate, 14-174-I  
 "To Market, to Market, to Buy a Pig," color plate, 14-174-F  
 "Tom, Tom, the Piper's Son," color plate, 14-174-B
- Mother liquid**, in sugar-making process, 9-116  
**Mother-of-pearl**, 3-262  
   inlay, 12-\*187  
   shell lined with, 3-141  
**Mother of Presidents**, nickname for Virginia, 8-418-A  
**Mother of Rivers**, nickname for New Hampshire, 8-242-B  
**"Mother of Southwestern Statesmen,"** nickname for Tennessee, 8-374  
**Mother's Day**, origin and observance of, 14-584  
**Moths**, main article, 3-†286-94  
   color plate, 3-\*294  
   how distinguished from butterflies, 3-287, \*288  
   life cycle, 3-\*270, 287, 288  
   silkworm moth, 9-†39, \*40, 41  
**Motion**, laws of, 1-†286-92, †306-13  
   and energy, 1-†339  
   and time, 10-469  
   and work, 1-333  
   causes of force, 1-297  
   Kepler's discovery of laws of, 1-103  
   speed of falling bodies, 1-†294-97  
   three kinds, 1-287, \*288  
   *see also* Perpetual motion
- Motion pictures**, *see* Moving pictures  
**Motive in music**, 12-250  
**Motor bus**, 10-\*279, 281  
   city systems, 7-†399  
**Motor cars**, *see* Automobiles  
**Motor nerves**, 2-330, 396  
**Motor truck**, for cleaning streets, 7-\*400  
**Motorcycle**, armored, 7-\*393  
**Motors**  
   airplane, 10-328-K  
   dynamos distinguished from, 1-502, 527  
   electric, 1-†527-28  
   run by light rays, 1-\*414  
   wave and tide, 1-352  
**Mottoes**, state, *see* subhead motto under each state  
**Moufflon**, sheep, 4-428  
**Mouldings**, in architecture  
   Adam brothers' use of, 12-\*192, 194  
   Gothic, 11-\*474  
   Romanesque, 11-452  
**Moulton**, F. R., quoted, 1-151  
**Mound builders**, Indian, *see* Mounds  
**Mound villages**, Sumerian, 5-76  
**Mounds**, of Mesopotamia, 5-76, 78; 11-404  
**Mounds**, burial, of Indians, 7-†96; 8-312-B  
   Illinois, 8-96  
   Ohio, 8-304  
   Moundsville, W. Va., 8-432  
   Wisconsin, 8-439  
**Mount**, William S., painting by, 11-\*371  
**Mount**, *see* name of mountains, as Olympus, Mount; Vesuvius, Mount  
**Mount Allison University**, N. B., 7-29-N  
**Mount Baker National Forest**, Wash., 7-\*408  
**Mount Desert Island**, Maine, 8-156, 151, 155  
   Acadia National Park, 8-156-A  
**Mount Eisenhower**, Canadian Rockies, color plate, 7-\*22  
**Mount Hamilton**, Calif., Lick observatory, 1-\*105  
**Mount Hope Bay**, R. I. and Mass., 8-347  
**Mount Katmai**, Alaska volcano, 1-76  
**Mount Lassen**, California volcano, 8-40  
**Mount McKinley National Park**, 8-16-A; 7-407  
**"Mount Monadnock,"** painting by George DeForest Brush, 11-361  
**Mount Olympus National Monument**, 8-428-A; 7-420  
**Mount Ranier National Park**, 8-428-A; 7-407  
**Mount Revelstoke National Park**, Can., 7-29-W  
**Mount St. Elias Range**, *see* St. Elias Range  
**Mount Shasta**, California, 8-40  
**Mount Sidney**, Virginia, 12-555-F  
**Mount Taylor Mountains**, New Mexico, 8-262  
**Mount Vernon**, Va.  
   Lafayette and Washington at, 12-\*452  
   Washington's home, 11-\*513; 12-\*473, 474  
   Washington's tomb, 12-\*478  
**Mount Wilson observatory**, 1-170, \*188, \*189  
**Mount Wrangell**, volcano in Alaska, 1-76  
**Mountain bluebird**, Nevada's state bird, 8-234-B  
**Mountain goat**, 4-428

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Mountain horse**, Welsh, 4-511  
**"Mountain Interval,"** poem by Frost, 13-349  
**Mountain Lake**, Fla., bird sanctuary, 4-517  
**Mountain laurel**  
     Connecticut's state flower, 8-62  
     Pennsylvania's state flower, 8-342  
**Mountain lion** (cougar), 4-292, †293-94  
**Mountain peak**, in physiography, 1-25  
**Mountain range**, in physiography, 1-25  
**Mountain republics**, 6-368  
**Mountain ridge**, in physiography, 1-25  
**Mountain sheep**, 4-\*425, †426  
     horns, 4-\*421  
     zoo, 4-478  
**Mountain State**, nickname for West Virginia, 8-436-B  
**Mountain system**, in physiography, 1-25  
**Mountain time**, 10-473  
**Mountaineers**, character, 1-24  
**"Mountaineers are always Freemen,"** motto of West Virginia, 8-436-B  
**Mountains**, main article, 1-†24-29  
     Afghanistan, 5-434  
     Africa, 1-29; 5-452, 453, 462  
         Sahara, 5-452  
     age, 5-432  
     Asia, 1-29; 5-336-B  
     Australia, 1-29  
     Belgium, age of, 6-351  
     building of: materials: growth stages, 1-20, 22  
     designs of Gutzon Borglum carved on, 11-\*361, 364  
     effect on character of a people, 1-24; 6-368, 468  
     Europe, 1-29; 6-162-C  
     **formation**, 1-†18-22  
         Silurian period, 3-17  
     fossils found on top of, 1-\*20  
     geosynclines, 1-20  
     Grand Canyon formation, 1-†46  
     Greenland, 6-482  
     Himalayas highest in world, 1-29; 5-†432, 441  
     Mediterranean islands, 6-472, 474, 477, 478  
     moon, 1-131, \*139, 140  
     North America, 1-†24 fol.; 7-33-A  
     sacred, 1-25  
     smoking, named for Vulcan, 1-75  
     South America, 1-28; 5-493, 518-A  
     tunneling through, 10-†203-6, \*207  
     upheavals, 1-21  
     vegetation, 2-\*195, 196, 197  
     West Indies, 7-55, 63, 64, 66  
     *see also names of mountains, as Adirondack Mountains; and mountain systems, as Alps; Andes; and also subhead physical features under countries and states*  
**Mountains of Heaven (Tien Shan)**, China, 1-29, 336-B  
     map, 5-590  
**Mountains of the Moon**, Africa, 5-462  
**Mountbatten**, Lord Louis, biography, 6-567  
     portrait, 6-548  
**Mountings** for wooden animals, 14-†61  
**Mountjoy**, Charles Blount, Lord, earl of Devonshire, 6-153  
**"Mourning Becomes Electra,"** drama by O'Neill, 13-354  
**Mourning dove**, 4-†80  
**Mourning rings**, 12-117  
**"Mourning Victory,"** sculpture by Daniel Chester French, 11-\*360  
**Mouse**, French word for, 8-302; *see also* Mice  
**Mouse deer** (deerlet), 4-413  
**Mouse hawk** (marsh hawk), 4-154, \*156  
**Mouse lemur**, monkey, 4-268  
**Mouse opossum**, 4-†469  
**Mouse River**, North Dakota, 8-302  
**Mouse Tower**, Bingen, Germany, 6-†207  
**Moussorgsky**, Modest, composer, 12-254, 313  
**Moustache**, of whippoorwill, 4-78  
**Moustache monkey**, 4-253  
**Mouth**  
     breathing through, 2-337  
     cause of appetite secretion in, 2-356  
     cause of watering in, 2-356  
     development necessary for teeth, 2-312  
     of horse, 4-514  
     *see also* Mouth parts  
**Mouth arms** of jellyfish, 3-110  
**Mouth organ**, musical instrument, 12-206  
**Mouth parts**  
     crustaceans, 3-176, 185  
     insects, 3-\*305, 320, 390, \*397, 402, 10-\*489  
         bees, 3-313  
         snakes, 3-\*483, †484, 485, \*499, \*501  
**Movements**, sections of symphony, 12-225, 235  
**"Movements and Habits of Climbing Plants, The,"** by Charles Darwin, 2-155  
**Moving-picture theater**, first, opened in Pittsburgh, 10-506  
**Moving pictures**, main article, 10-†502-12-B  
     animated cartoons, 10-512-A-512-B  
     are light used in movie-picture machine, 10-392  
     Australia, 5-560-G  
     camera, 10-†503 fol., 510, 512  
     center of industry, 7-343-F  
     continuity, 10-508  
     documentary films, 10-512-A  
         educational, 10-512  
     forerunners of, 10-502, †503  
     photoplays, 10-504  
         how written and produced, 10-†506-12  
         personnel in, 10-508, 509  
     produce illusion on retina, 1-437  
     projector, 1-\*433; 10-503, †505  
     sound pictures, 10-†504, \*506  
     studio, 10-504  
         play-production process, 10-†508-12  
**Mozambique**, colony, Africa, 5-464  
     map, 5-577  
**Mozambique Channel**, Africa, map, 5-577  
**Mozart**, Constance Weber (Frau Wolfgang Mozart), 12-268, 269

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



- Mozart, Wolfgang Amadeus, life and works**,  
 main article, 12-†266-72, †233, 237  
 and Beethoven, 12-278  
 friendship with Haydn, 12-270, 274, 275  
 piano described in letter, 12-258-E  
 portraits, 12-\*241, \*267  
 use of musical instruments  
   clarinet, 12-258-A  
   flute, 12-258-A  
   mandolin, 12-258-D  
   trombone, 12-258-B
- Mozart Museum**, Mozart's instruments in, 12-258-D, 258-E
- Mozier, Joseph**, statue by, 11-\*375
- "Mrs. Siddons as the Tragic Muse,"** by Joshua Reynolds, 11-†298
- "Much Ado About Nothing,"** drama by Shakespeare, 13-158
- Muchinga Mountains**, Africa, 5-491-B
- Mucin**, body lubricant, 2-358  
 in saliva, 2-355
- Mucius Scaevola**, *see* Scaevola, Caius Mucius
- Muckraking** by American writers, 7-308
- Mucus**  
 mollusk, 3-148  
 worm, 3-123
- Mud**, formation, 1-19
- Mud Cat State**, nickname for Mississippi, 8-206-A
- Mud Cats**, nickname for Mississippi natives, 8-206-A
- Mud-dauber wasp**, grub of, 3-\*298
- Mud eel**, salamander, 3-131
- Mud hen** (gallinule), 4-\*109
- Mud herons** (rails), 4-108
- Mud puppy**, salamander, 3-\*430, 431
- Mud turtle**, 3-475
- Mud Waddler State**, nickname for Mississippi, 8-206-A
- Mud Waddlers**, nickname for Mississippi natives, 8-206-A
- Mudheads**, nickname for natives of Tennessee, 8-374
- Muenster cheese**, 9-318
- Muezzin**, Mohammedan official, 5-418  
 call to prayer, 5-416, 418
- Muffler**, of automobile, 10-†287
- Mugger**, crocodile, 3-441
- Mugwumps**, American political party, 7-287
- Muir, John**, naturalist and author, 8-42-B
- Muir Glacier**, Alaska, 1-\*59, 64
- Muir Woods National Monument**, 8-42-B; 7-\*418, 420
- Muiiredach**, abbot of Monasterboice, 11-83
- Muiron**, gives life for Napoleon, 12-425
- Mukden, Battle of**, 6-438
- Mulberry tree**  
 cultivated by Fu Hsi, 5-314  
 Greek myth about, 14-438  
 silkworm food, 9-39, †40, 41
- Mule**, animal of horse tribe, 4-506, \*509  
 beast of burden, 6-\*330; 5-\*511
- Mule**, animal of horse tribe—*continued*  
 in coal mines, 9-442  
 Missouri, 8-210
- Mule deer**, 4-407, \*409
- Mulga**, plant, 5-560-J
- Mullica River**, U. S., 8-252
- Mullions**, window, 12-76
- Multiplication**  
 algebra, 10-433, 435  
 arithmetic, 10-430
- Multiplying rods**, of Napier, 10-\*425, 426
- Mummers**, English actors, 12-326
- Mummies**  
 American Indians, 7-92, †94  
 cats, in Egyptian tombs, 4-487  
 crocodile, 3-442  
 Egyptian, 5-\*51, 54, \*56, \*64  
   hidden in pyramids, 11-410  
   linen found on, 9-\*47  
   masks and portraits fastened to, 11-20  
   mended bones found in, 2-324  
*see also* Burial of dead
- Mumtaz-Mahal** (Taj-Bibi), Mogul empress, Taj Mahal built for, 9-†432; 11-†450
- Muncie**, Indiana, 8-\*108
- Mundie, William B.**, 11-518
- Mungo River**, Africa, woven bridge, 5-\*467
- Munich**, Germany, location, 6-241-B
- Munich Conference**, 6-108, 241, 502
- Municipal government**, main article, 7-†391-402  
 corruption, 7-372  
 fire department, 7-†394  
 forms, 7-391-93  
 police department, 7-†393  
 public enterprises, 7-400  
 streets, above and below surface, 7-†395-400  
 transportation systems, 7-†399  
 water supply, 10-535-42; 6-\*485; 7-398
- Munitions ship**, 10-\*415
- Munster**, Ireland, suffering in Sixteenth Century, 6-153
- Muntjac**, deer, 4-413
- Mur**, river, Austria and Yugoslavia, 6-265  
 map, 6-586
- Mural decoration**  
 Egyptian paintings, 11-\*6, 10; 12-26  
 Italian paintings, 11-110, 114  
 modern, 11-342  
 mosaics, 12-†112  
 Roman paintings, 11-†57, \*70, 71
- Murano**, island, Italy, glassworkers, 12-\*30, 32
- Murchison**, Cape, Latitude, 7-33-M
- Murchison, Sir Roderick Impey**, 3-21
- Murder**, a public wrong, 7-387
- "Murder in the Cathedral,"** poem by T. S. Eliot, 13-353
- "Murders in the Rue Morgue, The,"** by Edgar Allan Poe, 13-315
- Murdock, William**  
 lights factory with gas, 10-390  
 locomotive of, 10-176, \*179
- Muriate of potash**, used as fertilizer, 7-455

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Murillo, Bartolomé Esteban**, art, 11-258  
 paintings  
   "Counting the Money," 11-\*255  
   "Divine Shepherd, The," 11-\*256  
   Madonna, 11-\*257  
   "Melon Eaters, The," 11-\*255  
   "Old Woman with a Boy, An," 11-\*255  
   "Virgin with the Rosary, The," 11-\*254  
   "Young Beggar, The," 11-\*255
- Murmansk**, Russia, importance as port, 10-262  
 map, 6-600, E1  
 open during winter; cause, 6-443-A
- Murphy, Charles F.**, politician, 12-555-B
- Murray, Sir James**  
 "New English Dictionary," 10-\*25  
 portrait, 10-\*25
- Murray, James Stuart**, earl of, death, 6-\*119
- Murray River**, Australia, between Victoria and New South Wales  
 basin area, 10-257  
 length, 10-253  
 map, 5-601
- Murre**, bird, 4-204, 206-7
- Mürren**, Switzerland, lace maker, 12-\*166
- Murtagh, Henry B.**, music by, 8-332
- Muscatine**, Iowa, pearl buttons, 8-123
- Muscle sense** ("sixth sense"), 2-285
- Muscle Shoals**, Ala., engineering project, 1-370, 374  
 part of TVA project, 8-368  
 started under President Roosevelt, 7-341-A  
 Wilson Dam, 7-\*499
- Muscle spindles**, 2-285
- Muscles, structure and functions**, main article, 2-\*322, †326-31  
 blood vessels, 2-375  
 cells, 2-361  
 chemical action, 2-331  
 color plate, 2-\*326  
 contraction, 2-318  
 control by motor nerves, 2-388, 394, 396  
 diaphragm, 2-\*329, 337  
 ear, 2-304  
 effect of mouth and cheek muscles upon teeth, 2-312  
 exercises for development of, 2-†415 fol.  
 eye, 2-\*292, †296 fol.  
 heart, 2-326, 327, 370, \*375, 377  
 how the muscle engine works, 2-†329-31  
 lymph pressed upward by, 2-347  
 movement of bones by, 2-\*328, †329-31  
 nerve connection with ear canals, 2-284  
 posture training, 2-†415  
 respiratory, 2-340  
 striped (voluntary), 2-326, 327, \*330, 370  
 tendon, 2-328  
 unstriped (involuntary), 2-327, \*330  
 use in breathing, 2-337  
 waste products, 2-379  
 why they work in pairs, 2-396
- Muscovy Company**, 13-475, 476
- Muses**, in Greek mythology, 14-411, 412  
 with Apollo, 12-\*205
- Museums**  
 golf, 8-418-A  
 marine, 8-418-A  
 New York City, 8-284  
 Pennsylvania, 8-341  
*see names of museums, as* Metropolitan Museum of Art, New York; Prado, Madrid
- Mushroom coral**, 3-\*101, 102; 10-\*487
- Mushrooms**, 2-†71-76, \*55, †57
- Music**, main article, 12-†200-58; (*see also* Contents Volume 12 for chapter headings)  
 American Indian, 12-257  
 Apollo the god of, 12-\*205  
 Australia, 5-560-H  
**beginnings**, 12-†201-8  
 cantata, 12-232, 234  
 ceremonial, 12-\*203, 204; 7-102  
 chamber music, 12-234  
 chant, 12-212  
 chorus, 12-213  
 classicism, 12-246, 302  
 composers, *see* Musicians  
 copyright protection, 7-381  
 counterpoint, 12-216, 229  
   Bach, 12-263  
   Wagner, 12-250  
 dance, 12-240, 253  
 dissonance, 12-315  
**during Middle Ages**, 12-†212-17  
 electrically produced, 1-\*449  
 folk music, 12-212, 220, 246, †255  
 fugue, 12-230  
**Golden Age of**, 12-†219-27  
 Greek, 5-158, 159, 227  
 guilds, 12-217  
 harmony, 12-215  
 impressionism, 12-253  
 in nature, 12-201  
 instruments in orchestra, 12-258-258-F  
**modern**, 12-†229-37, †248-57  
 modes  
   Greek, 12-206-8  
   Gregorian, 12-212  
 negro spirituals, 12-256, 309; 9-†28  
 notation, 12-\*212, 213, \*214  
 opera, *see* Opera  
 oratorio, 12-232, 245, 265  
 orchestra, 12-223, 225, 237  
 patriotic, 12-242  
 Porto Rico, 8-476  
 program music, 12-242  
 Roman, 5-\*227, 229  
**Romantic movement**, 12-†239-46, 282  
 sacred  
   of ancient Hebrews, 12-204  
   of early Christians, 12-210-12  
   of great composers, 12-220, 230, 232, 237, 245, 260, †265, †307  
   Palestrina's achievements, 12-260

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Music, sacred—continued**

- Puritan attitude toward, 12-257
- Roman Catholic Mass, 12-230, 260
- scales, 12-206-8, 212, 215, 231
- chromatic, 12-258-A
- score, 12-\*212
- seven giants of, 12-†239-46
- sharps and flats, 12-212, 215
- signaling by means of, 10-29
- sonata and sonata form, 12-234-36, 274
- symphonic poem
  - Liszt, 12-246, 298
  - Strauss, 12-252, 315
- symphony, 12-225, 235-37
  - origin, 12-225

*see also under countries, as France, music and musicians; under musicians, as Mendelssohn; and under musical compositions, as "Moonlight Sonata"*

**Music drama**

- Gluck's operas a forerunner, 12-272
- Wagner's music drama, 12-294

*see also Opera*

**"Music Lesson, The," painting by Vermeer, 11-\*269****Music of the spheres, 1-169; 13-4****Musical instruments, main article, 12-258-258-E**

- accompanying Greek dances, 12-\*239
- ancient, 12-202
- Arabian stringed instrument, 12-\*223
- bagpipe, 12-258-C, 204; 6-\*130
- band, instruments in, 12-\*248
- bass viol, 12-258
  - ancestors, 12-222, 226
- brasses, 12-258-B
- clavichord, 12-258-D, \*221, 222
  - Bach's pieces for, 12-231, 232
  - description, 12-231, 264
- drums, 12-258-C
  - African, 12-\*202; 10-\*30
  - Japanese, 12-\*225
- dulcimer, 12-\*221
- electrical, 1-\*449
- Greek, 12-\*239
- harps, 12-258
  - accompany minnesingers, 12-216
  - Aeolian harp, 12-203
  - ancient, 12-\*81, \*206, \*221
- harpsichord, 12-258-D, \*221, 222, \*230, 231
- Hawaiian, 12-258-E; 8-457
- luten, 12-\*208
- lute, 12-258-D, \*213, 217, \*221, \*229
- lyre, 12-\*205, †206, \*212, \*226
  - first, mythology, 14-409
  - similar African instrument, 12-\*223
- orchestra, *see Orchestra*
- organ, *see Organ*
- Panpipes, 12-†204, 206
- percussion instruments, 12-258-C
- phonograph, 10-†497-500; 1-†443-45
- piano, 12-258-D, 234

**Musical instruments, piano—continued**

- ancestors of, 12-\*221, 222
    - pitch variation, 1-448, †449
  - prehistoric, 5-39
  - primitive, 12-\*203, \*207; 5-\*428, \*471
  - probable origin, 12-202
  - rebab, 12-213, 222, \*226
  - rebec, 12-†213, \*222, 226
  - shophar, 12-\*204, 205
  - spinnet, 12-258-E, \*221, 222, \*223
  - string quartet, instruments employed in, 12-233
  - strings, 12-258
    - early, 12-202
  - tambourine, 12-258-C, †203, \*239
  - tomtom, 12-202
  - viola, 12-258, 226, 233
  - violins, 12-258, †224-25, \*226
    - ancestor of, 12-222
    - in string quartet, 12-233
  - violoncello, 12-258, 226, 233
    - ancestor of, 12-222
  - viols, 12-222, 224, \*226
  - whistling jars, Peruvian, 12-\*202
  - wind, early, 12-203
  - wood winds, 12-258-A
  - zither, 12-258-E, \*221
    - similar to psaltery, 12-221
- see also names of instruments, as Harp; Piano; Violin*

**"Musical Journal, The New," 12-245, 290****"Musician, The," paintings**

- by Bartholomeus van der Helst, 11-\*260
- by Judith Leyster, 11-\*263

**Musicians, biographies of great, 12-†259-322**

- Bach, 12-†261-63
- Beethoven, 12-†277-80
- Berlioz, 12-†304-6
- Brahms, 12-301-2
- Chopin, 12-†291-93
- Debussy, 12-317-18
- Dvořák, 12-†308-10
- Gluck, 12-†270-72
- Gounod, 12-307-8
- great modern composers, 12-†248-57
- Grieg, 12-303-4
- Handel, 12-†263-65
- Haydn, 12-†273-76
- Liszt, 12-†297-98
- MacDowell, 12-321-22
- Mendelssohn, 12-†286-88
- Mozart, 12-†266-70
- musicians of eighteenth and nineteenth centuries, 12-\*241
- Palestrina, 12-†259-60
- pianists, 12-245, 246
- Rimsky-Korsakov, 12-312-13
- Rubinstein, 12-311-12
- Schubert, 12-†283-85
- Schumann, 12-†89-90
- seven giant composers, 12-†239-46
- song writers, 12-243, 244, 284

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Musicians, biographies of great—continued**

- Strauss**, 12-315-16  
**Sullivan**, 12-319-20  
**Tschaikovsky**, 12-314  
**Verdi**, 12-299  
**Wagner**, 12-†293-96  
**Weber**, 12-†281-82
- Musk**  
 perfumes contain, 9-302  
 strength of odor, 2-309
- Musk ox**, 4-390, \*391; 7-94-B
- Musk turtle**, 3-475, \*479
- Muskegon River**, Mich., 8-186-A
- Muskellunge**, fish, 3-238, \*240; 9-368
- Musketeer**, costume, 9-\*11
- Muskogean family of Indians**, members of, 8-6, 201
- Muskingum River**, Ohio, 8-312-A  
 Marietta situated on, 8-306
- Muskogee**, Okla., 8-319
- Muskrat**, nickname for people of Delaware, 8-66-A
- Muskrat**, 4-380, †382; 3-\*223  
 reservation, Alaska, 8-16-B
- Musquash**, American muskrat, 4-380, †382
- Mussel**, shellfish, 3-156  
 fresh water mussels, 3-†260-62  
 buttons made from shells, 9-†51
- Musselshell River**, Montana, 8-220
- Musset, Alfred de**, life and art, main article, 13-124  
 portrait, 13-\*124
- Mussolini, Benito**, Italian dictator  
 biography, 6-567  
 early patriotic efforts, 6-310  
 Fascist control in Italy, 6-312, 313-14  
 portrait, 6-\*309  
 quotation, 7-554  
 religious sentiments, 7-556  
 reviewing black-shirt legions, 6-\*496
- Mustangs**, horses, 4-514
- Mustapha Kemal (Pasha)**, president of the Turkish republic, 5-414
- Mustard**, plant; uses, 9-311
- Mustel of Paris, Victor**, invention of celesta, 12-258-C
- Mute**, device used to regulate musical pitch, 12-258
- Mutiny on the high seas**, 10-\*168, 169
- Mutsuhito (Meiji)**, emperor of Japan, 5-363
- Mutton**, sheep bred for, 9-76, \*77
- Mutules**, architecture, 11-\*419

- "My Antonia,"** novel by Willa Cather, 13-352
- My Aunt is back from Paris**, game, 14-161
- "My Homeland, Tennessee,"** song, 8-374
- "My Kentucky Home,"** song by Stephen Foster, 8-138-B
- "My Maryland,"** song, 8-162-B
- "My Own Life,"** by David Hume, 13-17
- "My Rhode Island,"** song, 8-347
- My ship is in**, game, 14-164
- "My Tennessee,"** song, 8-374
- Mycelium**, of fungus, 2-72
- Mycenae**, ancient city, Greece  
 art and archaeology, 11-31, \*33-34  
 "beehive" tombs, 11-416  
 daggers, 12-\*13, \*64  
 goldsmithery, 12-82  
 pottery, 12-\*47, \*48  
 Schliemann's excavations, 5-17, \*20
- Mycetozoa**, fungus, 2-\*75
- Myer, Albert F.**, builds Weather Bureau, 1-276
- Mygale**, hunting spider, 3-†410, 411
- Myocardium**, muscle tissue of heart, 2-370
- Myogenic theory** of heart beat, 2-372
- Myriapods**, creatures related to insects, main article, 3-†264-67  
 centipede, 3-†264  
 meaning, 3-267  
 millepedes, 3-\*265, \*266, 267
- Myron**, Greek sculptor, 11-43  
 "Discus Thrower," 11-37, \*38
- Myrrh**, 9-299
- Myrtle warblers**, birds, 4-58
- Mysore**, state, India, subdued by England, 5-382  
 map, 5-587
- "Mysterious Stranger, The,"** by Mark Twain, 13-330
- "Mystery of Edwin Drood, The,"** by Charles Dickens, 13-245
- Mythology**  
 American Indian, 7-100  
 Anglo-Saxon: Beowulf, 14-318-22  
 Chinese, 5-313  
 Greek and Roman, see Greek and Roman mythology  
 Indian (East), 5-366, 368  
 Scandinavian, 6-†370, 376  
 in the Eddas, 6-420  
 Valkyrie, 14-\*429  
 Volsunga Saga, 14-310  
 Teutonic, 6-205
- Mytilene**, Lesbos, Greece, 13-30
- Myxomycetes**, fungi, fruiting parts, 2-\*57



- NRA (National Recovery Administration)**, 7-343
- Nabonidos**, king of Babylon, 5-96
- Naboth**, vineyard of, 5-126
- Nabu-Aplu-Iddina**, king of Babylonia, cuneiform memorial, 12-\*106

- "Nabuco,"** opera by Verdi, 12-300
- Nagasaki**, Japan, and vicinity, map, 5-593  
 destroyed by atomic bomb, 6-555
- Nahac Indians**, 7-56
- Nahua Indians**, in Mexico, 7-68, 70

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Nail**, anatomy, made from skin, 2-†290, 291
- Nails**  
machine for making, 9-∗407
- Naismith, James**, invents basketball, 14-484
- Nakht**, tomb of, 11-†6
- Nam**, Ligurian king, 6-164
- Nancy**, France, attacked, 6-250
- Nanking**, China  
commerce and industry, 10-264  
looted by Japanese, 6-501  
map, 5-591, N6  
Porcelain Pagoda, 11-394
- Nank'ing, Treaty of**, 5-331, 332
- Nannar**, god, temple at Ur, 11-404, ∗405; 5-11
- "Nanook of the North,"** film, 10-512-A
- Nansei Islands**, Pacific Ocean, map, 5-593
- Nansen, Fridtjof**  
polar explorations, 13-†499  
maps showing route of, 13-500, 502-A  
portrait, 13-∗499
- Nantes, Edict of**, 6-170  
revocation, 6-184
- Nanticoke Indians**, Maryland tribe, 8-159
- "Nantucket,"** lightship, 10-∗228
- Nantucket**, Mass., island, 8-176-A
- Naphtha**  
by-product of petroleum, 9-456  
obtained from coal tar, 9-445
- Naphthalene**, obtained from coal tar, 9-444
- Napier, Robert**, 10-222
- Napier's bones**, calculating device, 10-∗425, 426
- Naples**, city, Italy  
after French occupation, 6-306  
and vicinity, map, 6-588  
arms of octopods sold in, 3-168  
location, 6-315-B
- Naples**, kingdom, Italy, 6-301  
and unification of Italy, 6-305, 306, 307  
art, 11-248  
owned by Spain, 11-248
- Naples, Bay of**, Italy, map, 6-588
- Napo River**, South America, rises in Ecuador,  
flowing to Amazon River, 5-518-F
- Napoleon I (Napoleon Bonaparte)**, life, main  
article, 12-†423-32  
art during reign, 11-∗287, 290  
birthplace, 6-472  
character and ability, 12-423, 425  
concern about footwear of army, 9-56  
Court of Fawcetts, 11-488  
Egyptian archaeology studied, 5-8  
Elba, 6-474  
empire at height, 12-430  
furniture during reign, 12-192  
golden bee symbol, 6-350  
"Hundred Days," 12-∗431, 432  
illustrations depicting scenes from life, 12-  
∗423 fol.  
Czar Alexander and, 6-∗434  
Directory overthrown, 6-∗193  
during Egyptian engagement, 5-∗55, ∗72  
Madrid, 6-∗333
- Napoleon I**---continued  
on road to Rivoli, 6-∗305  
Queen Louise pleading with, 6-∗224; 12-∗428  
Waterloo, 6-∗196  
last years, 12-∗429, ∗431, †432  
Louisiana Territory; acquisition and sale,  
6-332; 7-207  
Madame de Staël and, 13-122,  
marriages, 12-428  
portraits, 12-∗423; 7-∗353  
St. Helena, 12-432  
shoes named after, 9-56  
significance in France's history; rise to power;  
rule as emperor, 6-194, 196-97; 12-426  
government, 6-194; 7-355  
submarine plane submitted to, 10-†308  
tomb, 11-∗490  
treasures looted by, 11-81  
lion taken from St. Mark's, 11-487  
United States; relations with, 7-198  
Volta and, 1-∗499  
wars, 12-†424-32; *see also* Napoleonic Wars  
Waterloo, 12-435
- "Napoleon I and the Empress Josephine, The  
Coronation of,"** painting by David, 11-∗287
- Napoleon II (François Charles Joseph Napo-  
léon Bonaparte)**, titular emperor of France,  
6-200  
portrait, 6-∗306
- Napoleon III (Charles Louis Napoléon Bona-  
parte)**, emperor of France, reign, 6-199, †200  
Bismarck and, 12-∗448  
Italy aided, 6-308  
Maximilian sent to Mexico, 7-85  
portrait, 6-∗200  
Prosper Mérimée and, 13-131
- Napoleonic code**, *see* Code Napoleon
- Napoleonic Wars**, battles and campaigns, 12-  
424-32; 6-197  
Austria's participation, 12-424, 427 fol.; 6-  
267  
Tyrol signed over to Napoleon, 6-272  
blockade, 7-208; 6-90  
demands upon Portugal, 5-507  
Egyptian expedition, 12-426  
England's strategy; engagements, 6-87-91;  
12-421, 426, 428  
blockade; relations with U. S., 7-208  
Germany's participation, 6-†224-26; 12-430,  
432  
Queen Louise pleas in behalf, 12-∗428  
Italian expedition; Napoleon's government;  
changes wrought, 12-†424 fol.; 6-305, 306  
naval battles, 12-421-22  
Peninsular War, 12-434-35  
St. Sebastien defended, 6-∗87  
Poland's fate, 6-454  
Russia's relationships with Napoleon; mili-  
tary engagements, 6-†434, 435; 12-∗427,  
†430, †432  
Russian invasion, 12-†430, †432  
Scandinavia, 6-388, 407, 416

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

# **Napoleonic Wars—continued**

- Spain, 6-332
  - Madrid uprising, 6-\*331, \*333
  - Waterloo, 12-†435*see also* Vienna, Congress of
- Nara, Japan
  - first capital, 5-346
  - Great Buddha, statue, 5-346
- Nara, Japanese period, 5-346
- Naram-Sin, king of Akkad, stele of, 11-\*22, 25
- Narcissus, flower, Greek myth about, 14-441, 442
- Narcissus and Echo, mythology, 14-441, 442
- Narcotics Bureau, U. S., 7-377
- Narragansett Bay, R. I., 8-347
- Narragansett Indians, 8-344
- Narragansett pacers, 8-346
- Narrative poems, of Robinson Jeffers, 13-353
- Narthex, architecture, 11-443
- Narva, Battle of, 6-403
- Narváez, Pánfilo de
  - expedition to Mexico, 7-76
  - exploration, 7-119
- Narwhal, dolphin, 4-448
- Naseby, Battle of, 6-64, 66
- Nashville, Tenn., 8-366
  - home of Andrew Jackson, 8-\*366
  - industry, 8-371
  - location, 8-373, 367
  - replica of Parthenon, 11-\*415
  - temperature, 8-373
- Nashville, University of, founded, 8-369
- Nassau, capital of the Bahamas, 7-53
- Nassau, Fort, N. J., established by Dutch, 8-250
- Nasturtium leaves, water content, 2-259
- Natal, prov., Union of South Africa, history, 5-481, 482, 484, 487, 489
  - rainfall, 5-491-B
  - tea picker, 9-\*135
- Natchez, Miss., site of Fort Rosalie, 8-201
- Natchez Indians, destroy Fort Rosalie, 8-201
- "Nathan the Wise," by Lessing, 13-287
- Natica, mollusk, 3-146, 147, 149
- National American Woman Suffrage Association, 12-572
- National Archives Building, Washington, D. C., painting from Exhibition Hall, 12-†496
- National Archives Establishment, U. S., 7-381
- National Assembly, governing body of Portugal, 6-342-A
- National Association of Audubon Societies, 13-428
  - bird sanctuaries, 4-517
- National Association of the Red Cross, 7-428
- National Bank of the United States, *see* Bank of the United States
- National Bison Range, 8-220-A; 4-517
- National Cathedral, Washington, D. C., 11-\*521
- National cemeteries, 7-414
  - Tennessee, 8-374
- National Conservation Commission, 7-467
- National Conservatory of Music, New York, 12-309

- National costumes, *see* Costume, national
- National Council of Corporations, legislative power of Italy, 6-315-B
- National Covenant of Scotland, 6-126
- National Defense, Department of, 7-377, 471-479-E, 479-F-481, 482-89, 490-93
- National Defense Act, U. S., 7-474, 475
- National Eisteddfod (Congress of Bards), Wales, 6-†136, 139, \*140
- National Forests, U. S., reforestation; fire prevention, main article, 2-†240-47; *see also* Reforestation
- National Guard, U. S., 7-474
- National Health Council, 7-423
- National Labor Union, 7-283, 560, 561
- National League, baseball, 14-508
- National Library (Bibliothèque Nationale), Paris, 10-560
- National Memorial at Mount Rushmore, S. Dak., 11-\*361, 366
- National Monument of Petrified Forests, Arizona, 9-315
- National Monuments
  - Alaska, 8-16-A
  - historical, 7-†411-14
  - natural, 7-†416-21*see also* subhead monuments under each state; and also National parks
- National Museum, Hungary, 6-\*283
- National Museum, Washington, D. C., 7-\*370
- National Norwegian Theater, Bjornson and Ibsen honored, 13-99
- National Old Trails, 10-156
- National Park Service, 7-405
- National Parks, main article, 7-†404-9
  - Arizona's petrified forests, 9-315
  - Bryce Canyon, Utah, 7-409; 1-\*18, \*38
  - California, 8-42-B
  - Canada, 7-29-Q, 29-V, 29-W
  - Carlsbad, N. M., caverns, 1-\*84, 86
  - Grand Canyon, Arizona, 1-†46; 7-409
  - Hawaii, 8-461
  - Lehman Caves, Nevada, 1-\*85
  - military, 7-\*413, 414
  - Sequoia, California, 7-\*404
  - Shenandoah, Virginia, 7-409
  - Theodore Roosevelt's work, 7-309, 310
  - transportation, 7-405
- National Parks, Buildings, Reservations, Office of, 7-411
- National People's Party of China, 5-336-A
- National Physical Fitness Act, Canada, 7-33-I
- National Pike, 10-153
- National Recovery Administration (N. R. A.), 7-341-B
- National Republican Progressive League, 7-311
- National Resources Committee, report following drought and dust storms, 7-466
- National Road, United States, 10-148; 8-308
- National Safety Council, 2-425
- National shrines of American history, main article, 7-†411-14

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- National Socialist German Labor party**, *see* Nazis
- National Tuberculosis Association**, 7-423
- National University**, Ireland, 6-159
- Nationalism**, 7-555
- Italy, 6-312
- Spain, 6-332
- Native bear** (koala), 4-466, 467
- "Nativity,"** painting by Botticelli, 11-147
- Nativity**, the, *see* Madonna
- Natty Bumppo** (Leatherstocking), Cooper's hero, 13-296
- Natuna Islands**, South China Sea map, 5-589
- Natural Bridge**, Virginia, 1-†53
- height, 8-418
- in Great Valley, 8-411
- Natural Bridges National Monument**, 8-396-A; 7-419, \*420
- Natural gas**, *see* Gas, natural
- "Natural History,"** by G. L. LeC. Buffon, 13-421
- "Natural History,"** by Pliny the Elder, 13-54
- Natural History Museum**, *see* American Museum of Natural History
- "Natural History of Invertebrate Animals,"** by Lamarck, 13-418
- Natural monopoly**, 7-541, 542
- Natural resources**, conservation of, *see* Conservation of natural resources
- Natural selection**
- Darwin's theory, 13-436
- plants, 2-190, 204
- Naturalism**, method of approach in writing, 13-346, 347; *see also* Realism
- Naturalists**, biographies
- Agassiz, Louis J. R., 13-†431
- Audubon, John James, 13-†427
- Buffon, Georges Louis LeClerc, 13-†419
- Burbank, Luther, 13-†416
- Cuvier, Georges, baron, 13-†423
- Darwin, Charles R., 13-†434
- Gray, Asa, 13-†412
- Humboldt, Friedrich H. A., baron von, 13-†422
- Naturalization Service**, U. S., 7-378
- Nature**
- in Greek mythology, 14-†437-42
- in painting, *see* Painting, landscape
- laws of, 13-12
- music in, 12-201
- sounds in, 12-201; 10-1
- "Nature,"** essay by Ralph Waldo Emerson, 13-304, 305
- Nature study**
- animals, *see* animal topics listed below; and *also* Animals
- animals at the zoo, 4-†474-81
- animals of our streams and brooks, 3-†222-24
- aquariums
- a trip to the city aquarium, 3-†217-20
- how to make and keep one at home, 14-†2-5
- birds, 4-†1-231 (*see* Contents Volume 4)
- Audubon's studies, 13-427-28
- Nature study, birds—continued**
- color plates, 4—frontispiece, \*8, \*40, \*72, \*120, \*152, \*184, \*232
- food for the bird table, 4-15, 17, 125
- how to identify songs and calls, 4-†5
- how to make bird houses, 14-†40, †41; 4-†124
- birds attracted to, 4-19, †35, 36, 61, 135
- see also* Birds
- cats, domesticated, 4-†483-88
- conservation of natural resources, 7-†465-70
- national monuments, 7-†416-21
- national parks, 7-†404-9
- dogs, domesticated, 4-†490-503
- geological studies, 1-†1-93, (*see* Contents Volume 1 for chapter headings)
- a stream tells its story, 1-†46-49
- action of sea on land, 1-†69-72
- caves, 1-†84-87
- color plates
- strata, 3—frontispiece
- volcano, 1—frontispiece
- fossils, *see* Fossils
- mountains and mountain building, 1-†17-29
- rocks, formation and kinds, 1-†51-54
- igneous and sedimentary, 1-11, †19
- see also* Rocks
- soil formation, 1-†94-97
- springs; underground streams; wells, 1-†89-92
- see also* Earth; Geology
- insects, 3-†268-404 (*see also* Contents Volume 3 for chapter headings)
- color plates, 3-\*270, \*278, \*286, \*294, \*342
- see also* Insects
- microscope, objects disclosed by, 10-†487-90
- plants, 2-†1-165 (*see* Contents Volume 2 for chapter headings)
- flowers, 2-143-75; *see also* Flowers
- grafting of plants, 2-†231, \*262
- grasses, 2-†177-80
- how new plant types are produced, 2-†226-33
- how to recognize plant parasites, 2-†55-58
- reforestation, 2-†240-47
- trees; how to recognize, 2-†266-76; *see also* Trees
- see also* Plants
- seashore study
- jellyfish, sea firs, sea moss, etc., 3-†104-15
- sea shells, 3-†141-49
- color plate, 3-\*166
- pictures made with, 12-109
- seaweeds, 2-†66-69
- sky; some interesting sights in, 1-†270-72
- aurora borealis, 1-†526
- clouds, 1-†234-37
- comets; meteors; falling stars, 1-†161-67
- rainbow, color plate, 1-\*274, 271, 438
- as weather sign, 1-265
- sunset, 1-220
- see also* Astronomy; Moon; Planets; Sun

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Nature study—continued**

- stalking and pathfinding, 14-†561-68
- stars, 1-†169-80
  - star maps; color plates, 1-178-A-178-L
- weather, 1-†192-273 (*see also* Contents Volume 1 for chapter headings)
  - color plates, 1-\*242, \*243, \*274
  - how to study, 1-†263-68
  - instruments for recording, 1-†207-8, †258-61, †274-78

**Nature worship, 5-32**

- mountains, 1-24, 25
- see also* Animals, sacred; Druids and Druidism; Fire worship; Sun worship

**Naugatuck River, Conn., 8-62****"Naughty Doll, The," by Eugene Field, 13-343****Nausicaa, mythological character, 5-157****Nautical mile, 10-469****Nautilus, sea creature, 3-172**

- prehistoric ancestor, 3-9
- shell, 3-\*145
- Silurian period, 3-18

**Nauvoo, Ill., 8-100****Navajo Indians, 7-†96, \*97, \*101**

- Arizona, 8-22
- Canyon de Chelly National Monument, 8-24
- modern, 8-261
- Navajo National Monument, 8-24-A
- stock, 8-317

**Navajo National Monument, Arizona, 8-24-A****Navajo rugs, 12-†140****Naval academy, U. S., *see* United States Naval Academy****Naval armaments, limitation of, *see* Disarmament****Naval Asylum School, 7-488-B-88-C****Naval bases, 7-488-D****Naval College, Newport, R. I., 7-488-B****Naval Militia, U. S., 7-488-B-88-C****Naval Observatory, U. S., broadcasts time, 10-469****Naval powers**

- ancient, 10-162, 163
- medieval, 10-166, 167
- modern, 10-167 fol.

**Naval stores, 8-82****Nave, architecture, 11-†442****Navel oranges, 9-175****Navies**

- developed by countries with fisheries, 9-365
- modern, beginning of, 13-440
- war vessels after invention of gunpowder, 10-358, †360, †365 fol.

**Navigation**

- compass, 10-†454-57
  - used since days of Columbus, 1-489
- "great circle" sailing, 10-233
- lighthouses, 10-†226-29
- magnetic charting expeditions, 1-491
- magnetic storms, 1-489
- sailing, 14-†527-30; 10-160

**Navigation—continued**

- U. S. control of navigable waters, 10-250
- U. S. lighthouse and marking service, 7-380

**Navigation Acts, British, 7-159**

- New York's reaction to, 8-276

**Naxos, island in Aegean Sea, products, 8-358-B****Nayarit, state, Mexico, map, 7-596****Nazareth, town, Palestine, 5-133**

- Nazis, German political party, 6-240-41; 7-554
  - Austria and Germany, 6-275
  - party congress at Nuremberg, 6-\*494
  - war crimes trial, 6-241-A

**Neanderthal man, 5-\*23, †24, \*30, 39****Neapolitan mandolin, 12-258-1)****Nearchus, Greek admiral, map showing route of, 5-\*180****Nearsightedness, 1-437, †438****Neat's-foot oil, used on shoes, 9-72****"Nebraska," etymology, 8-228-A****Nebraska, state, U. S., description and history, main article, 8-†222-27; general data, 8-228-228-B**

- agriculture, 8-223, †225
- Arbor Day originated in, 14-583
- area, 8-228
- capital and capitol building, 8-\*222
- charities and correction, list, 8-228
- cities, towns, list, 8-225, 226, 228-B
- climate, 8-228
- counties, list, 8-228-A
- education, 8-226
  - institutions of higher learning, list, 8-228
- flag, 8-228-A
- fossil plant found in, 2-\*2
- Glacial Age, 1-†61
- history, 8-224-25
  - admitted to Union, 8-225
- holidays, 8-228-A
- Indians, 8-224; 7-233
  - reservations, 8-228-A
- location, 8-228
- map, 8-518
  - on United States map, 7-594
- monuments, 8-228-A
- motto, 8-228-A
- name, 8-228-A
- nicknames, 8-228-A
- physical features, 8-228, 222
- political facts, 8-227, 228
- products and industries, 8-226
- railroads, 8-226
- reservations, game and bird, 8-228-A
- rivers, 8-228
- state bird, 8-228-A
- state flower, 8-228-A
- state song, 8-228-A
- Willa Cather depicts, 13-352

**Nebraska, University of**

- agricultural college, 8-\*223
- nickname of football team, 8-228A

**Nebraska City, Nebraska, industries, 8-226**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



- Nebraska River, U. S.**  
name, 8-228-A
- Nebraska Territory, North Dakota part of, 8-299**
- Nebuchadnezzar, king of Babylon**  
Alexander the Great in palace of, 12-346  
Babylon rebuilt by, 5-95  
cuneiform inscription, 10-\*43  
destruction of temple in Jerusalem, 5-125  
fame as a warrior, 5-96  
Hanging Gardens of Babylon built by, 5-185; 11-408  
Jews taken to Babylon by, 5-103, †127  
palace of, found, 5-13  
wipes out Assyria, 5-14
- Nebulae, astronomy, main article, 1-†182-83**  
planetary, 1-183  
solar system evolved from, 1-4
- Nebular Hypothesis, 1-\*5, 6**  
Laplace author of, 13-406
- Necessity, Fort, 8-342**
- Neches River, Texas, 8-386**
- Neck, anatomy, lymphatics in, 2-347**  
color plates, 2-\*278, †326, \*327
- Necker, Jacques, 6-188**
- Necker, Madame Jacques, 13-122**
- "Necklace, The," by de Maupassant, 13-134**
- Necklaces, 12-†65, \*119, \*121, \*123**
- Nectar, botany, 2-102**  
gathered by bees, 3-313
- Nectarine, fruit, 9-168**
- Needle, mountain type in physiography, 1-25**
- Needle, phonograph, 1-444; 10-498, 500**
- Needlepoint lace, 12-\*164, \*165, 168**
- Needles**  
first steel, 9-408  
magnetic, 10-455  
origin, 10-443  
stone, of Red Paint People, 8-148
- Needlework**  
embroidery, 14-†74; 12-\*138, 140, 164, \*171  
lace and lace making, 12-†163-72  
tapestry, 12-†137-44  
*see also* Things to make, needlecraft
- Nefertiti, queen of Egypt, portrait bust, 11-\*18, 19; 9-\*91**
- Negative, photographic, 10-\*450, †451**
- Negative and positive charges, electricity, 1-542**
- Negative and positive numbers, algebra, 10-434**
- Negri Sembilan, one of nine native states forming part of the federation of states known as, Malaya, 5-430-B**
- Negritos, people**  
Philippine Islands, 5-562, \*564, 568, 570  
primitive Malaysians and East Indians, 5-425, 523
- Negro marmoset, 4-267**
- Negro Mountain, peak, Penn., 8-341**
- Negro music, 9-†28**  
Dvořák's use of, 12-256, 309
- Negro republics**  
Haiti, 7-57
- Negro republics—continued**  
Liberia, 5-448, 470, 472  
Santo Domingo, 7-57
- Negroes**  
African  
Congo peoples, 5-467 fol.  
fear of ocean, 1-66  
life and customs, 5-\*443, †445-48, \*457 fol., †468 fol., \*475 fol.  
pigmies, 5-445, 467, \*468-70  
relations with Boers, 5-478 fol.  
religious ceremonies and beliefs, 5-†446  
tribal warfare, 5-478, 481  
tribes, 5-175, 478, \*480, †481  
wood carving; masks, 12-96, \*98
- American  
African colonies founded for, 5-470  
Booker T. Washington, 12-†569-70  
Civil War, 11-358; 7-263  
cotton industry dependent on, 7-217, †245, 246  
depicted in American drama, 13-355  
education, 8-7, 417  
college at Dover, Del., 8-66-A  
illiteracy, 8-75  
intermarriage with whites forbidden  
Kentucky, 8-138-A  
Louisiana, 8-143, 144  
Plantation life, 9-†28, \*32; 10-\*403 fol.; 7-\*245  
population in United States, 7-343-F  
position during Reconstruction, 7-†268-74  
South Carolina: predominance, 8-355  
spirituals (music), 12-256, 309; 9-†28  
Tennessee, 8-374  
West Virginia: forbidden to attend schools for white, 8-436-A
- Bermuda, 6-490  
races, 5-†43  
color of skin, 1-193; 2-288  
five most important, 5-445  
West Indies, 7-51 fol., 54-B, †62-66
- Negroid peoples**  
Africa, 5-445, 472  
East Indies, 5-523
- Negros, island, Philippines, map, 5-595**
- Negus Neguet (King of Kings), 5-460**
- Nehalem River, Oregon, 8-331**
- Nehemiah, Hebrew leader, rebuilds Jerusalem, 5-129**
- Nehru, Jawaharlal, biography, 6-568**
- Nejd, former kingdom of Western Asia, now a division of Saudi Arabia**  
map, 5-583
- "Nelly Bly," song, 8-138-B**
- Nelson, Horatio, Viscount Nelson of the Nile, life, main article, 12-†420-22**  
Battle of Trafalgar, 12-422  
Copenhagen's surrender to, 6-416  
"Death of Nelson," painting by West, 11-312  
meeting with Wellington, 12-\*434

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Nelson, Horatio—continued**

- quoted, 10-220  
 Southey's life of, 13-220  
 victories over Napoleon, 12-426, 430  
**Nelson Monument**, London, 12-420  
**Nelson River**, Manitoba Province, Canada, its outflow Hudson Bay, length, 10-253  
 map, 7-592  
**Nemean lion**, mythology, 14-426  
**Nemiskam National Park**, Manitoba, 7-29-V  
**Nengo**, Japanese chronology, 5-346  
**Nennius**, monk, writes history of Britain in Arthur's time, 14-377  
**Neodymium**, element, symbol, atomic no. and wt., 1-551  
**Neolithic Period**, civilization, 5-\*33, †34-40; *see also* Stone Age  
**Neon**, element, an inert gas, 1-547  
 air contains, 1-376  
 atomic structure, 1-\*541, 542  
 symbol, atomic no. and wt., 1-551  
 use, 1-377  
**Neon lamp**, 1-\*416  
 inventor, 1-346  
 results from study of electric current in vacuum, 1-514  
**Neon light**, 10-392  
**Neo-Platonism**, St. Augustine influenced by, 13-533  
**Neoprene**, artificial rubber, 9-271-B  
**Neosho River**, U. S., 8-131  
**Nepal**, kingdom, Asia, description, 5-441  
 map, 5-580  
**Neptune (Poseidon)**, god, 14-†407; 1-158, \*159  
 and Amphitrite, 14-435  
 contest with Athena, 5-\*152  
 Parthenon sculpture representing, 11-†420  
 fol.  
 in "The Odyssey," 13-30  
 kingdom, 14-435-36  
**Neptune**, planet, description, 1-158; table, 1-106  
 place in solar system, color plate, 1-98; table, 1-106  
 size, 1-\*16  
**Neptune, Father**, crossing Equator, 10-\*300  
**Neptune's cup**, sponge, 3-85  
**Neptunium**, man-made element, 1-\*551, 558-G  
**Nereids**, sea nymphs, 14-435  
**Nereus**, mythological character, 14-435  
**Nero**, emperor of Rome, 5-235-36  
 and Christian martyrs, 5-\*234; 11-\*440  
 as singer, 5-227  
 emerald eyeglass, 9-433  
 snow brought from Alps, 10-515  
 statuery taken from Delphi, 12-16  
 tries poison on slave, 5-\*233  
**Neoprene**, 9-271-B  
**Nerva, Marcus Cocceius**, emperor of Rome, 5-240

**Nerves**

afferent and efferent, 2-395

**Nerves—continued**

- auditory, 2-304  
 head, 2-\*378  
 leg, 2-\*376  
 motor and sensory nerves, 2-330, 396  
 nerve canals of bone, 2-\*320, \*323  
 nerve endings in eye, 2-292  
 nerve endings in skin, 2-289, \*290, 291  
 optic, 2-\*296, \*299, \*300, \*385  
 sense cells connected with, 2-307, 308  
**Nervous system**, main article, 2-†392-97  
 blood-supply control, 2-379  
 central, front view, 2-\*384  
 control of muscles, 2-389, 394, 396  
 of animals, 2-393  
 reflex actions, 2-393, 397  
 reflex system between ear canals and muscles, 2-284  
 substances harmful to, 2-395, 397  
*see also* Brain  
**Nessus**, centaur, 14-\*457  
**Nest building and breeding**  
 birds  
 auk, 4-207  
 bittern, 4-104  
 bluebird, 4-\*16, †17  
 bobolink, 4-†88  
 bobwhite, 4-†96  
 bower bird, 4-186  
 brown creeper, 4-126  
 cardinal, 4-133  
 catbird, 4-26  
 chickadee, 4-62  
 chimney swift, 4-\*32, 38, 39  
 communal nests, 4-234, 236  
 coot, 4-110  
 crested cassique, 4-\*181  
 dummy nests, 4-101  
 eagle, 4-152  
 eggs laid in nests of other birds, 4-76, 89, \*174, 175  
 emu, 4-238  
 female plastered into nest, 4-†194, 196  
 finch, 4-\*83  
 flamingo, 4-\*197, 198  
 flightless birds, 4-†234, 236, 238  
 flycatcher, 4-43, 137, 138  
 grackle, 4-\*90  
 grebe, 4-\*107, 110  
 grosbeak, 4-83, \*84  
 ground dove, 4-146  
 gull, 4-203  
 hawk, 4-154  
 heron, 4-107  
 hornbill, 4-194  
 humming bird, 4-142, 178  
 killdeer, 4-117  
 kiwi, 4-239  
 lark, 4-87  
 loon, 4-122  
 male bird destroys eggs, 4-\*93  
 mason birds, 4-42

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Nest building, birds—continued**

- mocking bird, 4-134-35
- oriole, 4-†26, 27-28
- osprey, 4-157
- ostrich, 4-234
- owl, 4-166
- penguin, 4-†219, 221
- rookeries, 4-219
- phoebe, 4-42
- puffin, 4-208
- quail, 4-144
- redstart, 4-47
- red-winged blackbird, 4-45, 46
- rhea, 4-236
- road runner, 4-143
- robin, 4-19
- old sites chosen, 4-\*15, \*18
- rookeries, 4-\*145, 200, 202; *see also* Rookeries
- sparrow, 4-84, 85, 101
- stork, 4-197
- swallow, 4-\*33, †34, \*37, \*38
- tailor bird, 4-182
- titmice, 4-173
- turkey buzzard, 4-163
- veery, 4-55
- warbler, 4-†38
- water chicken, 4-110
- waxwing, 4-28
- weaver bird, 4-†182
- woodcock, 4-114
- wren, 4-20, 21, 101
- fishes, 3-228, †229, †231, 233, 246
- insects
  - ants, 3-†320
  - bees, 3-298 fol.
  - termites, 3-†374
  - wasps, 3-†304 fol.; 9-†273
- millepedes, 3-\*266, 267
- mouse lemur, 4-269
- squirrels, 4-366

**Nesting boxes for birds**

- kinds of birds attracted by, 4-19, †35, 36, 61, 135
- points to be observed in, 4-†124
- proportions and designs suitable for, 14-†40, †41

**Net profit, 7-533****Netherlands, description and history, 6-\*344**

- †345, †352-55; general data, 6-350-A; *see also* index World War II, 6-493
- area, 6-355-A
- art, *see* Dutch painting
- birds, 4-197
- canals and dikes, 6-355-A, 352, 353, †354
- climate, 6-355-A
- colonization and exploration
  - Australia discovered by Dutch, in Seventeenth Century, 5-545, 546
  - Madagascar settled by, 5-464
  - New World
    - colony at mouth of Hudson River, 13-477

**Netherlands, colonization—continued**

- Delaware, 8-64
- Hartford trading post, 8-56
- Hudson's voyage financed by Dutch merchants, 13-476
- influence on American customs, 13-477
- New York State, 8-271-74; 7-128, 130, \*131
- trading posts in New Jersey, 8-250
- South Africa settled by Dutch, 5-476-79
- Cape Colony captured and sold, 5-479
- sends orphan girls to Cape Colony, 2-229
- contrasted with Spain, 11-261
- costume, 6-\*351 fol.; 9-\*9, \*13
- hats and headdresses, 6-\*352; 9-\*88, \*93
- wooden shoes, 9-57, \*61
- crafts
  - furniture, 12-\*187
  - glassware, 12-\*33, †34
  - laces, 12-\*171
  - pottery, 12-\*40, 58
- dogs used as beasts of burden, 4-500
- drainage system, 6-352
- fisheries, 9-366
- flag, color plate, 14—following 570, no. 46
- flooded fields chief means of defense, 6-354
- government, 6-355-A
- haven for Jews, 5-137
- history
  - struggle with Spain for control of sea, 10-169
  - Reformation, 6-\*347, \*350, 354
  - rival of England for control of sea, 10-170
  - under Charles V, 6-326
  - Philip II's treatment of, 6-\*328
  - Inquisition, 6-328
  - Louis XIV's war against, 6-184
  - war against France, 6-353
  - war against England, 5-479
  - invaded by Germany, 6-355
- location, 6-355-A
- maps, 6-592
  - on map of Europe, 6-570
- music and musicians, 12-216, 222
- Patroon system, 8-274-75
- people, 6-355-A
- physical features, 6-355-A
- population, 6-345, 352, 354
- port; sailing ship era, 10-\*233
- possessions
  - American, 7-33-N
  - Borneo, 5-427
  - Pacific, 5-522 fol.
  - South America, 5-518-B
  - West Indies, 7-51, 63
- products and industries
  - coal, 6-355-A
  - dairying, 6-\*351; 9-347, 348
  - flower bulb growing, 6-354; 2-230
  - meat production, 9-329
  - peat, 6-352
  - poultry, 9-358
  - provinces, 6-355-A

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Netherlands—continued**

- rivers, 6-351, 352
- sea power, 6-†353; 10-169, \*170
- Separatists in, 7-†124
- sledges, 10-\*131
- spear, 10-\*355
- trade, 6-\*353, 355
  - Antwerp, 6-326, 348
  - bulb, 6-354
  - cheese export, 9-347
  - food imported, 6-345
  - India, 5-378, 379
  - Japan, 5-354, 357, 361
  - Malay Peninsula, 5-426
  - meat export, 9-329
  - merchant marine, number, 10-232
  - nutmeg, 9-208
  - spices, 9-206
- waterways, 10-256; *see also subhead canals above*
- windmills, 1-\*227; 6-\*344, \*345, 352; 9-348
- yachts, 14-527
- Nets**, fishing with, 9-362, †363, \*365
- "Nets to catch the wind,"** sails, 10-159
- Netsuke**, Japanese ornament, 12-102
- Neuces River**, Texas, 8-386
- Neufchâtel**, cheese, 9-348
- Neuilly, Treaty of**, Bulgaria loses strip of land along Aegean, 6-368-A
- Neumes**, musical notation, 12-\*212, 213, \*214
- Neuritis**, 2-365
- Neuromuscular bundle of His**, 2-372
- Neuse River**, N. C., 8-296
- Neutral**, lard, 9-373
- Neutrality act**, 7-343-B
- Neutron** in atom, 1-499
- "Nevada"** meaning, 8-234-B
- Nevada**, state, U. S. description and history, 8-†230-34; general data, 8-234-A-234-B
  - agriculture, 8-232
  - area, 8-234-A
  - charities and correction, list, 8-234-A
  - cities, towns, list, 8-233, 234-B
  - climate, 8-234-A, 231
  - counties, list, 8-234-B
  - education, 8-234
  - institutions of higher learning, list, 8-234-A
  - flag, 8-234-B
  - history, 8-232
    - included in Mormon state, 8-393
    - silver mines, 9-388; 7-\*276, 277
  - holidays, 8-234-B
  - Hoover Dam, 8-\*22, \*230
  - Indians, 7-93, \*101, \*105
    - reservations, 8-234-B
  - interesting facts, 8-234-B
  - irrigation, 8-233
  - location, 8-234-A
  - map, 8-521
    - on United States, map, 7-594
  - monuments, 8-234-A
  - Lehman Caves, 7-417; 8-234-B; 1-\*85

**Nevada**, state, U. S.—*continued*

- motto, 8-234-B
- name, 8-234-B
- nicknames, 8-234-B
- physical features, 8-234-A, 230
- political facts, 8-234-A
- products and industries, 8-233
- reservations, game and bird, 8-234-B
- rivers, 8-234-A
- state bird, 8-234-B
- state flower, 8-234-B
- state song, 8-234-B
- Nevada, University of**, 8-\*231
- Nevins, Marion** (Mrs. Edward MacDowell), 12-322
- New Albion**, name given California, 8-36
- New Amsterdam**, old name for New York City, 8-274
  - captured by English; becomes New York, 7-130
  - Dutch fortresses, 7-138, \*529
  - glassworks, 12-36
  - Peter Minuit, 8-272
  - name changed, 8-274
  - scene in, 11-\*520
  - settlement, 7-128
  - signing of first deed, 7-\*391
  - see also* New York City
- New Bedford**, Mass.
  - textile industry, 8-173
  - trade, 8-170
  - whaling, 8-168
- New Bern**, N. C., 8-289
- "New Bonnet, The,"** painting by Eastman Johnson, 11-\*369
- New Britain**, Conn., 8-60
- New Brunswick**, N. J., 8-251
  - medical supplies, 8-248
- New Brunswick**, prov., Canada, 7-†29-I.-N, 33-A; map, 7-593
  - history, 7-13, 14, 19, 23, 29-M
  - population, 7-33-A
  - resources and industries, 7-†29-I.-N, 33-A; 9-\*145
- New Brunswick River**, Canada, log jam, 7-\*16
- New Brunswick, University of**, Canada, 7-29-N
- New Caledonia**, island, Pacific, 5-521, 526, 522
  - nickel, 9-420
- New Canary**, formerly New Jersey, 8-252-A
- New Castle**, Del., 8-66
- New Connecticut**, early name for Vermont, 8-404
- "New Deal,"** F. D. Roosevelt's slogan, 7-340
- New Delhi**, capital, India, 5-387-A
- New Echota Marker**, Georgia, 8-84
- "New Eloisa, The,"** by Rousseau, 13-19
- New England**, section of U. S.
  - Andros as governor, 8-57
  - agriculture
    - need for tree crops, 7-463

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**New England, agriculture—continued**

*see also heading, agriculture under* Connecticut; Maine; Massachusetts; New Hampshire; Rhode Island; Vermont

architecture, 11-496, \*497, †498-99, \*507, \*508

doorways, 11-\*503, 505

baked beans, 8-176-B

colonial life, 7-†146-53

compared with state of Virginia, 8-409

early churches and houses, 11-†496-99

factories and capitalists, 7-217

glacier, 8-149-50

named by Captain John Smith, 8-151

New Jersey annexed to, 8-251

pioneers in Ohio, 8-306

products and industries, 8-239, 240, 241

cotton manufacture, 8-239, 240; 9-34

fisheries, 9-365-66

loss of textile trade, 8-239

silk weaving, 9-38

Puritans, 7-†125-29, \*146 fol.

rivers, 7-343-C

secession suggested, 7-211

settlement; first colonies, 7-†124-28; 8-151

settlers from, plant New Jersey villages, 8-251

stone fence, 8-\*168

township form of government, 8-171

*see also* Connecticut; Maine; Massachusetts;

New Hampshire; Rhode Island; Vermont

**"New England Courant, The,"** newspaper, 12-463

**New England of the West,** nickname for Minnesota, 8-198-A

**"New English Dictionary,"** 10-25

**"New Era in American Poetry,"** by Louis Untermeyer, 13-348

**New France, history,** main article, 7-†1-8, †135-43

area, 7-5

colony of, 13-473

*see also* French in America

**"New Freedom,"** Woodrow Wilson's policies, 12-549; 7-312

**New Gottenberg, Pa.,** early Swedish settlement, 8-334

**New Granada,** district in South America, 5-500, 505, 507; *see also* Colombia; Ecuador; Venezuela

**New Guinea, island, Malay Archipelago,** 5-525 *see also* index World War II, 6-493

animals resemble those of Australia, 5-525

birds

bird of paradise, 4-\*183

bower bird, 4-185

cassowary, 4-236

pigmy parrot, 4-192

map, 5-597

part in Indonesian Union, 5-529-B

part under Australia, 5-525

people, 5-521, 525

visited by Jorge de Menezes, 5-545

**New Guinea, Territory of,** 5-525

**New Hampshire, state, U. S., description and history,** main article, 8-†236-42; general data, 8-242-A

agriculture, 8-242

area, 8-242-A

charities and correction, 8-242-A

cities, towns, list, 8-242-B

industries, 8-240, 241

climate, 8-242-A

counties, list, 8-242-B

education, 8-242

institutions of higher learning, list, 8-242-A

flag, 8-242-B

history, 8-237-39

constitution adopted, 8-238

"New Hampshire grants," 8-401

signs Declaration of Independence, 7-173

holidays, 8-242-B

Indians, 8-238

lakes and rivers, 8-238

location, 8-242-A

map, 8-522

in United States map, 7-595

name, 8-242-A

parks, 8-242-A

physical features, 8-237, 242-A

political facts, 8-242-A

products and industries, 8-238 fol.

glassworks, 12-36

rivers, 8-242, 242-A

skiing, 8-236

state bird, 8-242-B

state flower, 8-242-B

state song, 8-242-B

water power, 8-242

**New Hampshire, County of,** 8-152

**New Hampshire, University of,** engineering building, 8-\*237

**"New Hampshire,"** poem by Frost, 13-349

**New Hampshire grants,** 8-401

**New Haven, Conn.**

former capital, 8-56

founding, 8-56

manufactures, 8-60

temperature, 8-62

Yale University, 8-61

**New Hebrides, islands, Pacific Ocean,** 5-521, 526

**New Holland, early name for Australia,** 13-489

**New Jersey, state, U. S., description and history,** main article, 8-†244-51; general data, 8-252-252-B

agriculture, 8-245, 248

celery, 8-\*248

area, 8-252

capital, 8-244

charities and correction, 8-252

cities, towns, list, 8-246-49, 252-A

climate, 8-252, 246

connection with Manhattan, 8-248

counties, list, 8-252-A

education, 8-251

institutions of higher learning, list, 8-252

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**New Jersey**, state, U. S.—*continued*

flag, 8-252-A  
 fossils found in, 3-43  
 history, 8-250-51  
   Benjamin Franklin represents, 12-466  
   settlers for Ohio organized, 8-307  
   signs Declaration of Independence, 7-173  
 holidays, 8-252-A  
 Indians, 8-250  
 industry, *see below*, products and industries  
 location, 8-252  
 map, 8-524  
   on United States map, 7-595  
 monuments, 8-252-A; 7-412, \*413  
 motto, 8-252-A  
 name, 8-252-A  
 nicknames, 8-252-A  
 parks, 8-252-A  
 passes first road-building law, 10-156  
 physical characteristics, 8-245, 249, 252  
 political facts, 8-252  
 products and industries, 8-245 fol.  
   dairy industry, 8-245, \*247  
   mineral products, 8-249  
   oil refining major industry, 8-248, \*250  
 reservations, game and bird, 8-252-A  
 resorts, 8-246, 249  
 rivers, 8-252, 247, 250  
 state flower, 8-252-A  
 state song, 8-252-A  
 trade, 8-244 fol.  
 Woodrow Wilson governor of, 12-549  
**New Lanark mills**, Scotland, 7-438  
**New Learning**, *see* Renaissance  
**"New Life, The,"** of Dante, 13-59  
**New London**, Conn.  
   boat races, 14-533  
   commerce, 8-59  
**New Madrid**, Mo., earthquake, 1-81  
**New Mexico**, state, U. S., **description and history**, main article, 8-254-61; general data, 8-262-262-B  
 agriculture, 8-260  
 area, 8-262  
 capital and capitol building, 8-\*254  
 Carlsbad Caverns, 7-409; 1-\*84, 86  
 charities and correction, list, 8-262  
 cities, towns, list, 8-261, 262-B  
   pueblos, 8-255, 257-58.  
 climate, 8-262, 256  
 counties, list, 8-262-B  
 education, 8-260  
   institutions of higher learning, list, 8-262  
 Elephant Butte Dam, 8-260, \*382; 10-542  
 flag, 8-262-A  
 history, 8-257-60  
   admitted to Union, 8-260  
   included in Mormon state, 8-393  
 holidays, 8-262-A  
 Indians, 8-255, 260-61; 7-93, \*103  
   costume, 8-\*259  
   pottery, 8-260; 12-\*47

**New Mexico**, Indians—*continued*

Reservations, 8-262-A  
 Revolt, 8-259  
 interesting facts, 8-262-A  
 irrigation, 8-256, 260  
 location, 8-262  
 map, 8-527  
   on United States map, 7-594  
 modern, 8-260  
 monuments, 8-262-A  
   Capulin Mountain, 8-262-A; 7-417  
   cliff dwellings, 8-262-A; 7-421  
   El Morro National Monument, 8-262-A; 7-\*418, 419  
 motto, 8-262-A  
 name, 8-262-A  
 nicknames, 8-262-A  
 parks, 8-262-A  
 physical features, 8-255, 262  
 products and industries, 8-260; 1-97  
 political facts, 8-262  
 reservations, game and bird, 8-262-A  
 state bird, 8-262-A  
 state flower, 8-262-A  
 state song, 8-262-A  
**New Mexico, Territory of**, 8-259  
**New Mexico, University of**, 8-†255  
**New Moon**, crescent, 1-\*124, 127  
**"New Musical Journal, The,"** Schumann's publication, 12-245, 290  
**"New Netherland,"** ship, 8-272  
**New Netherland**, colony, 8-272  
   smoking, 7-\*149  
**New Netherland Company**, 8-272  
**New Orleans**, La., 8-141, 145  
   average summer temperature, 1-211  
   captured by Farragut, 7-260  
   dock scene of early days, 7-\*247  
   French quarter, 8-\*143  
   importance to frontiersmen, 7-206  
   Louisiana passes to Americans, 7-\*205  
   "Place d'Armes," 8-†141  
   temperature, 8-146  
   water supply, 10-542  
   waterfront, 10-\*252  
**"New Orleans,"** first Mississippi steamboat, 7-214  
**New Orleans, Battle of**, 7-211; 12-512  
   anniversary a holiday, 8-146-A  
**New Orleans boat**, 8-307  
**New Orleans Industrial Canal**, 8-146  
**New Plymouth**, New Zealand, 5-\*541-A  
**New Pomerania**, island, Pacific Ocean, map, 5-597  
**New Providence**, island of Bahamas, 7-53  
**New River**, N. C., 7-493  
**New River**, Va., 8-418; *see also* Kanawha  
**New Siberian Islands**, maps, 6-603; 5-573; 13-502-A  
**New South Wales**, state, Australia, history, 5-547-50, 551, 556, 557, 558

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**New South Wales—continued**

- map, 5-601
- member of Commonwealth of Australia, 5-560-L
- Mount Kosciuszko, 1-26
  - silver mine, 9-\*388
- "New Spain," nickname for New Jersey, 8-252-A
- New Spain**, Spanish district in America, 5-500
  - government; civilization; wealth, 7-42, 79-81
  - territory lost, 7-83
- New Stone Age**, civilization, 5-†34-40, \*33; 11-3
  - implements, 11-\*2-3
  - lake dwellers, 5-†33 fol.; 6-244-45; 9-†46
  - pottery, 12-47
  - see also Stone Age
- New Sweden** (Delaware), 8-66-A
- New Testament**
  - Erasmus' edition, 13-83
  - Luther translates into German, 13-544
  - Tyndale, 10-13
  - see also Bible
- "New Whip for the Dutch, A," picture, 10-\*170
- "New World Symphony," by Anton Dvořák, 12-310
  - English horn used in, 12-258-A
- New Year**
  - Egyptian calendar, 10-180
  - Roman calendar, 10-482
- New Year's Day**, observance, 14-577, \*579
  - in Korea, 14-499
  - Pasadena, Calif., 8-43
- New York**, state, U. S., description and history,
  - main article, 8-†264-82; general data, 8-283-284-B
  - agriculture, 8-278
  - animal life
    - lampreys, 3-\*252
    - osprey colonies, 4-157
    - protection of turtles, 3-475
    - weasels, 4-356
  - area, 8-283
  - art institutions, 8-284
  - Barge Canal, 10-266, 274
  - capital and capitol building, 8-\*264
  - charities and correction, 8-284
  - cities, towns, list, 8-280 fol., 284-B
  - Civil War, 8-277
  - climate, 8-283
  - compared with Georgia, 8-83
  - counties, list, 8-284-B
  - early boundaries, 8-274
  - education, 8-282
    - educational institutions, list, 8-283
  - flag, 8-284-A
  - glacier, 1-†61
  - history, 8-270-77
    - early province, 8-274
    - early territorial claims, 8-401
    - signs Declaration of Independence, 7-173
  - holidays, 8-284-A
  - Indians, 8-269-71, 275
  - life and customs, 8-269, 270; 7-\*3, \*101, \*107

**New York, Indians—continued**

- present day, 8-284-A
- reservations, list, 8-284-A
- treaty, 7-154
- interesting facts, 8-282, 284-A
- lakes, 8-283
- libraries, public, 10-556
- location, 8-283
- map, 8-528
  - on United States map, 7-595
- mineral springs, 1-90
- motto, 8-284-A
- name, 8-284-A
- national monuments, 8-284-A
- Niagara Falls, see Niagara
- nicknames, 8-284-A
- parks, 8-284-A
- patroon system, 8-274
- physical features, 8-283, 264
- political facts, 8-284
- population; growth, 8-275
- presidents from, 8-282
- problems, 8-278
- products and industries, 8-278-81; 9-124
- reservations, bird and game, 8-284-A
- Revolutionary War, 8-277
- rivers, 8-283
- state bird, 8-284-A
- state flower, 8-284-A
- state song, 8-284-A
- transportation, 8-279
- "New York, Our Empire State," song, 8-284-A
- New York Central Building**, New York, 11-\*519
- New York Central Railroad**
  - earliest trains and locomotives, 10-\*182
  - started by Cornelius Vanderbilt, 10-190
- New York Charity Organization Society**, 7-444
- New York City**, N. Y., 8-281
  - birds set free in, 4-25, 225
  - City Hall, 11-511, \*516
  - Civil War draft resisted by determined rioting in, 7-262
  - Dutch fortresses, 7-138, \*529
  - Dutch influence, 13-477
  - early
    - captured by English, 8-277
    - eighteenth century, 7-\*150, \*153, \*154, 193
    - 1980, scenes from photoplay, "Just Imagine," 10-511
  - early Dutch houses, 11-\*497, 499
  - first deed signed in, 7-\*391
  - founded by Dutch, 13-477
  - freight terminals, 10-\*198
  - harbor, 8-\*268
  - Hayden Planetarium, 1-\*190
  - Hell Gate power station, 1-\*507
  - Hudson River's importance, 10-256
  - humidity, 1-393
  - libraries, 8-284
    - first children's, 10-558
  - milk consumption, 9-338
  - New Jersey helps supply, 8-245

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**New York City—continued**

- museums, 8-284
- name, 8-274
- New Amsterdam taken from Dutch; named New York, 7-130
- parks, 8-284-A
- Police Department, Theodore Roosevelt as commissioner of, 12-544
- political corruption, 7-281
- port, 10-246, 247, 250
  - docks, 10-\*198
  - unloading of latex, 10-\*248
  - waterfront, 10-250
- purchase from Indians in early days, 7-128, \*131
- Rockefeller Center, 11-†510
- seal, 8-274
- shipping, 10-234
- sky line, 5-\*184; 8-\*267; 11-\*520
  - eighteenth century, 7-\*153
  - uptown business center, 7-\*532
  - Wall Street district, 7-\*510
- skyscrapers, 11-†517-20, \*522, 524
- street scenes with and without overhead wires, 10-\*112
- temperature, 8-283
- transportation systems, 10-\*198
- tunnels, 10-\*202, \*206, 207
- Washington's plan for military attack on, 12-456
- water supply, 10-†538-41; 1-369; 7-398
  - first water system, 7-\*396
- "**New York Evening Post**," edited by William Cullen Bryant, 13-298
- New York Harbor**, 8-\*268; 10-293
  - Jersey City situated on, 8-248
- "**New York Herald**"
  - beginning of, 7-242
  - sends Stanley to Africa to find Livingstone, 13-554
- New York Metropolitan Chess League**, 14-490
- New York Public Library**, N. Y. C., 8-284
- New York School of Social Work**, 7-444
- New York State Barge Canal**, its early fame, 10-274
- New York State Monument**, Gettysburg, Penn., 7-\*413
- New York "Sun,"** famous daily, beginning of, 7-242
- New York Telephone Company Building**, 11-\*517
- "**New York Times**," excerpt on the finish of the sun, 1-386
- New York Yacht Club**, 14-528
- New York Zoning Law**, 11-517, 524

- New Zealand**, Dominion of, So. Pacific Ocean,
  - description and history, main article, 5-†531-41; general data, 5-541-B
  - animal life
    - birds
      - giant moa, 4-233
      - kiwi, 4-†238

**New Zealand**, animal life, birds—*continued*

- parrot, 4-192
- penguin, 4-221
- tuataras, 3-462-63
- area, 5-541-B
- charter, 13-506\*
- climate, 5-541-B
- Cook Islands governed by, 5-528
- exports, 5-539, 540, 541; 9-347
- flag, color plate, 14-following 570, no. 47
- giant trees, 9-\*247
- government, 5-541-B, 537-41
- history, 5-†531-41
  - races in, 5-531
    - discovered and annexed by England, 5-523
    - explored by Captain Cook, 13-489
    - church colonies, 5-537
    - becomes separate colony, 5-537
    - made a dominion of British Empire, 5-540
    - part in World War 1, 5-540; World War 11, 5-541-A
- hot springs, 1-\*35, †36, 200, \*383
- industries, *see below* products and industries
- kite flying by natives, 14-502
- land question, 5-536, 537
- location, 5-541-B
- Maoris, 5-521, 531
- maps, 5-598
  - on map of World, 5-572
- people, 5-521, 541-B
- physical features, 5-541-B
  - mountains, 1-29
- prehistoric period, 3-35, 60
- products and industries
  - canning, 9-228
  - cattle raising, 5-\*538
  - cheese, 9-347
  - coal, 5-541-B
  - export goods, 10-240
  - gold, 5-538, 539
  - hemp, 9-287
  - minerals, 5-541-B
  - sheep raising, 5-538, 539, 540; 9-75
- provinces, 5-541-B
- rivers, 5-541-B
- social legislation, 5-540, 541
- New Zealand Company**, 5-534, 536
- New Zealand hemp** (New Zealand flax), 2-151; 9-287
- Newark**, Canada, meeting place of first legislature, 7-14
- Newark**, Del., university, 8-64, 66-A
- Newark**, N. J., 8-†246, 249
  - former seat of Princeton University, 8-251
- Newark airport**, 8-249
- Newars**, race, of Asia, 5-441
- Newbold**, Charles, cast iron plow, 7-452
- Newburgh**, N. Y., Washington's headquarters, 7-\*197
- Newcastle-on-Tyne**, England, industries, 10-254
  - map, 6-572, E1
- Newcomen**, steam engine, 10-\*397, 398

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**"Newcomes, The,"** by Thackeray, 13-241  
**Newfoundland**, Canadian province, No. Atlantic Ocean, **description and history**, 7-†31-33;  
 general data, 7-33-B  
 airports, 7-29-F, 33-B  
 becomes Crown colony, 7-33  
 climate, 7-33-B, 33-M  
 decides to join Canada, 7-29-F  
 economic problems, 7-33  
 geographical position, 7-31  
 map, 7-593  
 natural advantages, 7-31  
 natural resources, 7-33-B  
 fisheries, 7-†31 fol., \*27  
 iron deposits, 9-408  
 people, 7-33-B  
 physical features, 7-33-B  
 terminus of Atlantic cable, 10-103  
 votes not to enter union of Canadian provinces, 7-23  
 won by England, 7-7  
**Newfoundland Banks**, No. Atlantic Ocean  
 destruction of icebergs, 1-64  
 explored by the Cabots; fishing vessels, 7-2  
 fisheries, 9-364; 7-32, \*33  
**Newgate prison**, London, 6-\*85  
**"Newly Married, The,"** by Björnson, 13-98  
**Newport**, R. I., 8-346  
 evidence of Norse settlements, 7-112  
 founding of, 8-344  
 yacht races, 8-347  
**Newport News**, Va., 8-415, 417  
**News**  
 early ways of spreading, 10-27, \*73-74, \*75  
 how gathered for newspapers, 10-78  
**New-skin**, 10-552  
**Newspapers**, main article, 10-†73-82  
 ancient, 10-73  
 Australia, 5-560-G  
 cabled photographs, 10-\*94  
 early European and American, 10-74  
 first, published by Defoe, 13-176  
 first paper printed on train, 13-442  
 founding of great American dailies, 7-242  
 news-gathering agencies, 10-78  
 paper used for, 9-275 fol.  
 part played in politics, 7-371  
 printing and distribution, 10-†77 fol.  
 "Spectator" and "Tatler," 13-181  
**Newsprint**, 9-275 fol.  
**Newstead Abbey**, England, 13-225, 226  
**Newton, Sir Isaac**, **life**, main article, 13-†400-401  
 and Halley, 13-402; 1-164  
 apple tree of, preserved, 1-14  
 calculus discovered by, 13-15  
 contribution to world, 1-304  
 gravitation, law of, 1-301; 13-401  
 Kepler paved way for, 1-288  
 light theory, 1-415  
 color, 1-438  
 mass and weight distinguished by, 1-303  
 motion, laws of, 1-†307, †312, 313

**Newton, Sir Isaac—continued**  
 portrait, 13-\*400  
 reflecting telescope invented, 13-401  
**Newtown**, Mass., migration of people, 8-56  
**Newts**, amphibians, 3-†428, 430  
 compared with salamanders, 3-429  
**Neyba Valley**, Dominican Republic, rock salt, 7-54-A  
**Neyhart, Amos E.**, work in driving education, 2-435  
**Nez Percé**, Indian tribe, in Oregon, 8-327  
 Oklahoma land grant, 8-317  
**Nez Percé War**, 8-89  
**Nezahualcoyotl**, Indian king, Mexico, 7-70  
**Ngake**, discovers New Zealand, 5-531  
**Ngauruhoe**, volcanic peak, New Zealand, 5-541-B, \*531  
**"Niagara,"** ship, Atlantic cable laid by, 10-104, 105  
**"Niagara,"** warship, in Battle of Lake Erie, 7-484; 12-499, 500  
**Niagara Falls**, No. Amer., 1-†78; 5-\*185  
 age, 1-60  
 boundary between United States and Canada, 8-283  
 color plate, 7-\*22  
 discovery, 8-274  
 Niagara limestone, 8-266  
 power plants, 1-508  
 Silurian rock, 3-18  
 source of power, 1-\*341  
 winter scene, 1-\*78, \*270  
**Niagara River**, No. Amer., 1-78  
**Niall of the Nine Hostages**, Irish king, 6-145  
**Nibelungenlied**, German epic, 6-210  
 same as Saga of the Volsungs, 6-420  
 story of Siegfried retold, 14-†310-17  
 Wagner's "Ring" based on, 12-295, 296; 14-310  
**Nibelungs** in German mythology, 14-310, \*311  
**Niblick**, golf club, 14-495, 497  
**Nicaea, Council of**, 12-365  
**Nicaragua**, country, Central America, **description**, 7-47; **general data**, 7-48-B  
 area, 7-48-B  
 climate, 7-48-B  
 flag, color plate, 14-following 570, no. 48  
 government, 7-48-B  
 location, 7-48-B  
 map, 7-598  
 mixture of peoples, 7-43  
 people, 7-48-B  
 physical features, 7-48-B  
 relations with U. S.; possible canal route through, 7-47  
 state in Central America, 7-41  
 U. S. Marines withdrawn, 12-456-D  
**Nicaragua, Lake**, Central America, 7-48-B, 47  
 map, 7-598  
**Nice**, French city, perfume making, 9-302  
**"Nice,"** changes in meaning of, 10-19  
**Nicene Creed**, 12-365

- Nicholaivitch, Leo**, *see* Tolstoy, Leo  
**Nicholas, Saint**, 7-617  
**Nicholas I**, czar of Russia, reign, 6-435  
 and Poland, 6-454  
**Nicholas II**, czar of Russia, reign, 6-437  
 abdication, 6-439  
 execution, 6-441  
 opposes revolutionary spirit, 6-438  
 portrait with family, 6-438  
**Nicholas Land**, Arctic Ocean, map, 13-502-A  
**"Nicholas Nickleby,"** by Charles Dickens, 13-245  
**Nichols, Arthur Bell**, 13-248  
**Nichrome**, alloy, poor conductor of electricity, 1-514  
**Nicias of Athens**, painting by, 11-\*70  
**Nickel**, element, 9-420  
 German silver contains, 9-420  
 melting point, 1-\*392  
 symbol, atomic no. and wt., 1-\*551  
**Nicobar Islands**, Indian Ocean, maps, 5-589, 587  
**Nicolet, Jean**, explorations, 8-440; 7-\*138  
**Nicolle, Richard**, New York named by, 8-284-A  
**Nicosia**, capital of Cyprus, 6-\*479  
**Nicot, Jean**, 9-222  
**Nicotiana**, name for tobacco, 9-222  
**Nicotine**, poisonous alkaloid, in tobacco, 9-221  
 insect killer, 10-546  
**Niello work**, 12-80, 88  
**Niemen (Memel River)**, Europe, 10-258  
 bridge at Tilsit, 10-\*211  
 Lithuania, 6-464-B  
**Nieppe de Saint-Victor, Claude Félix Abel**, 10-447  
**"Nieuw Amsterdam,"** stateroom on, 10-\*296  
**Niger, Colony of the, Africa**, 5-473  
**Niger River**, in West Africa, flowing from about  
 the Sierra Leone frontier to Gulf of Guinea,  
 5-473-A, 470; map, 5-574  
 basin area, 10-257  
 length, 10-253  
**Nigeria**, colony, Africa, description, 5-471  
 headdress, 9-\*93  
 maps, 5-574, 576  
 mud-plastered houses, 9-\*377  
 transportation, 10-\*133  
**"Nigger of the Narcissus, The,"** by Joseph  
 Conrad, 13-274  
**"Niggertoes"** (Brazil nuts), 9-\*201, 203  
**"Night,"** statue by Olin L. Warner, 11-\*375  
**Night driving**, 2-438-39, \*442  
**"Night Watch, The,"** painting by Rembrandt,  
 11-274, \*275  
**Nightcap limpet**, mollusk, 3-145  
**Nighthawk**, 4-\*76, 77, \*97, 98  
 "bug eater," nickname for, 8-228-A  
**Nightingale, Florence**, nursing in Crimean War,  
 6-†99; 7-426, \*429  
**Nightingale**, bird, 4-†170-71  
 in American sanctuary, 4-517  
 member of thrush family, 4-\*171  
**Nightingale, American** (mocking bird), 4-134  
**"Nights, The,"** by Alfred de Musset, 13-124  
**Nightshade family**, plants, 9-144  
**Nihilists, Russian**, 6-436  
**"Nihongi"** (Stories of Japan), 5-341, 346  
**Niihau**, island of Hawaiian group, 8-461  
 map, 8-562  
**Nike Apteros**, temple of, Athens, 11-46  
**Nike of Samothrace (Victory of Samothrace)**,  
 11-55, \*56  
**Nikon**, father of Claudius Galen, 13-359  
**"Nil sine Numine,"** motto of Colorado, 8-52-B  
**Nile, Battle of the**, 12-421, 426  
**Nile, river, Egypt**, 5-473-A, \*73-A, 73-B, 455, 461  
 alluvial soil deposited by, 1-97  
 Aswan Dam, 5-61; 1-366  
 basin area, 10-257  
 canal, 5-56  
 canal to Red Sea, 10-270  
 cataracts, 5-48, \*59  
 channel through first, 5-59, 60  
 Delta, 5-48, 61, 73-B  
 floating islands, 2-264  
 importance to Egyptian farmers, 5-49  
 irrigation by, 10-528  
 land flooded and fertilized by, 5-47, 461  
 length, 10-253  
 maps, 5-\*48, 575, 582  
 mouth of Nile, map, 5-578  
 sculptured representation, 5-\*49  
 transportation on, 5-144  
**Nile crocodile**, 3-\*439, \*441, 442  
**Nile monitor**, lizard, 3-460  
**Nile valley**, fertility, 10-529  
**Nilgai**, antelope, 4-\*417  
**Nimbus clouds**, 1-236, \*239  
**Nîmes**, France, ancient monuments, 13-133  
 Maison Carrée, 11-†432  
 Roman aqueduct, 10-\*210  
**Nimitz, Chester**, admiral, 12-\*555-I  
**Nimrud**, Assyria, archaeology, 5-14  
**"Niña,"** ship of Columbus, 13-†450  
**Nine-banded armadillo**, 4-455  
**Nine Pipe Bird Refuge**, 8-220-A  
**Nineteenth Amendment** (woman suffrage), 7-336  
**Ninety-five Theses, Luther's**, 13-\*542, 543  
**Ninety-two Resolutions**, in history of Quebec,  
 13-571  
**Nineveh**, ancient city, Assyria  
 art and archaeology, 11-26; 5-14, \*84, 91  
 destroyed by Babylon, 5-14  
 fall, 5-84, 92  
**Nintoku**, legendary Japanese emperor, 5-344  
**Niobe**, mythological character  
 killing of children, 14-457-58  
 painting of, 11-\*49, 50  
**Niobium**, element, symbol, atomic no. and weight,  
 1-\*551  
**Niobrara Game Preserve**, 8-228-A  
**Niobrara River**, U. S., 8-228  
**Nipkow**, German scientist, patents apparatus for  
 transmitting pictures over wire, 10-124  
**Nippon**, *see* Japan

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Nirvana**, state of blessedness, 5-370
- Nitrate of silver**, 9-395  
effect of sunlight on, 10-446
- Nitrate of soda**, fertilizer, 7-454
- Nitrates**, 1-97, 370, \*537; 5-515  
Death Valley deposits, 8-34  
South American export, 10-241
- Nitric acid**, chemical, 10-548  
ammonia used in manufacture, 10-546  
Chile saltpeter used in, 10-546
- Nitrocellulose**, 10-552
- Nitrogen**, element  
air contains, 1-219, †374, 538; 10-546  
as fertilizer, *see* Nitrogen fertilizers  
cause of caisson disease, 1-462; 10-522, 524  
chemical behavior, 1-547  
dynamite contains, 10-415  
"fixing" methods, 10-546  
found in proteins, 2-41  
given to soil by pea family, 2-168  
manure provides, 10-546  
necessary to form chlorophyll, 2-45  
plants unable to take directly, 10-546  
symbol, atomic no. and wt., 1-\*551  
taken from air by bacteria, 2-21
- Nitrogen cycle**, 1 538
- Nitrogen fertilizers**, 7-454; 10-546; 1-†537, 538; 2-45
- Nitroglycerin**, chemical, 10-416
- Nitrous oxide**, anesthetic, 13-385
- "Nixie" letters**, mail, 10-\*84, 90
- Niza**, Marcos de, *see* Marcos de Niza
- Nizam-ul-mulk**, friend of Omar Khayyam, 13-89
- No**, Japanese drama, 5-351
- "No man's land"**, in World War I, 10-362
- Noah**, story of, mosaic, 11-\*78
- Noah's Ark**, 5-\*117  
model, how to make, 14-†34  
mosaic, 12-\*111
- Nobel, Alfred**, founder of the Nobel Prizes, 6-407; 10-417
- Nobel Prizes**, 6-390  
Dawes' Plan awarded, 12-456-F  
Peace Prize awarded Jane Addams, 12-581
- Nobile, Umberto**, Arctic flight, 13-502
- Noble gases**, 1-376, 547
- Noble Order of the Knights of Labor**, 7-561
- Noble the Lion**, in "Reynard the Fox," 14-324
- Nobleman**, May the month of, 11-97
- Nobunaga**, Japanese leader, 5-351  
attitude toward Christianity, 5-354
- Noctiluca**, animalcule, 2-18; 3-80
- "Noël"**, meaning of, 14-590
- Nofert**, Egyptian princess, statue, 11-\*10
- Nohl, Max**, diver, 10-526
- Noiseless typewriter**, 10-64
- "Noli Me Tangere"**, by José Rizal, 5-568
- Nomads, Arabian**, 5-395
- Nomarch**, district ruler, Egypt, 5-59
- Nome**, Greek name for district, 5-58
- Nome, Alaska**  
antitoxin carried to, 10-130
- Nome, Alaska--continued**  
gold discovered, 8-13  
longest day, 1-202
- Non-Intercourse Act**, U. S., 7-209
- Nones**, 10-482
- Nonsense, Fort, N. J.**, 7-412
- "Nonsense Novels"**, by Leacock, 13-580
- Noon**, time reckoned from, 10-470
- Nootka Sound**, Vancouver Island, Captain Cook's vessels in, 7-\*18
- Nopal**, cactus, food of cochineal bugs, 9-305
- Norden, Carl L.**, inventor, 7-486
- Nordenskiöld, E. A.**, 13-500
- Nordenskiöld Sea**, Arctic Ocean, map, 13-502-A
- Nordic race**, 5-†267  
branch of Indo-Europeans, 5-44  
Europe, 6-162-D  
Norwegian girls, 5-\*45  
peoples belonging to; distribution, 5-†39
- Nordkyn, Cape**, location, 6-162-C
- Nordraak, Richard**, and Grieg, 12-303
- Norfolk, Va.**, 8-416  
consolidated with other ports, 8-415  
rainfall and temperature, 8-418
- Norfolk cattle**, 9-332
- "Norge"**, airship, 10-\*324; 13-502
- Normal schools**, *see under each state subhead* education, institutions of higher learning.
- "Normalcy"**, meaning and use of word, 7-332
- Norman, Cape**, location by Lat and Long, 7-29-Z
- Norman, Okla.**, university at, 8-316
- Norman architecture**, 11-456
- Norman Conquest**, 6-16, 19
- Norman Wells**, Canada, oil, 7-\*29-W, 29-X
- "Normandie"**, steamship, 7-\*570; 10-\*293
- Normandy**, ancient province, France and English kings, 6-169, 174, 176 36  
lost by England, 6-23  
won by vikings, 6-375
- Normandy**, modern, France, Canadian forces, World War II, 7-\*29-E
- Normans**, people  
castles, 11-457  
England, 6-16, 19; 10-11  
Ireland, 6-148  
influence English architecture, 11-456  
influence Gothic art, 11-94  
Italy and Sicily, 5-298  
migrations, 5-268  
origin: Latinized in France, 6-14  
Scotland, 6-111  
ships, 10-\*163, 167  
strain of, in Scots, 6-111  
viking ancestry, 6-375  
Wales, 6-138  
war with Franks, 6-\*168
- Norridgewock Indians**, 8-150
- Norris, Frank**, author, 13-346  
background of period, 7-308
- Norris Dam**, Tenn., 8-\*368
- Norse horse**, 4-\*508
- Norse literature**, 6-419, 420; 14-310

**Norsemen**

- descendants in France, 6-202-B
- discovery and settlement of Greenland, 6-483; 7-1; 13-495
- raid German towns, 6-207
- ship, 13-\*495
- see also* Northmen

**North, Frank J., 10-192**

- North, Frederick, Lord,** and colonial taxes, 7-161
- North Africa, description and history,** main article, 5-†450-55; *see also* under Africa map, 5-574

**North America, continent, general data, 7-33-M-33-N**

- altitudes, highest and lowest, 1-25
- animals, 7-33-N
- area and location, 7-33-M
- Cabot the first English explorer to land on, 13-471
- climate, 7-33-M
- coast line: danger spots, 10-234
- divisions, 7-33-N
- flags first used in, 14-573
- history, *see* Contents Volume 7
- Ice Age, 1-59, 60, †61
- islands, 7-33-M
- joined to Asia in Pleistocene, 3-61
- language spoken, 7-33-N
- maps, 7-591
  - on map of World, 5-572
- minerals, 7-33-N
- mountains, 1-27; 7-407
- oldest civilizations, 7-68
- oldest land, 8-438
- people, 7-33-N
- physical features, 7-33-M
- religion, 7-33-N
- rising of Pacific Coast, 1-70
- rivers, 10-267-68; 7-33-M
- territory held by European countries before and after 1763, 7-†139, 143
- vegetation, 7-33-N
- see also* America, and names of countries, as Canada; United States

**North Atlantic route, 10-233-34****North Australia, state, Australia, 5-558****North Cape, Norway, Midnight Sun, 6-407-A****North Carolina, state, U. S., description and history, main article, 8-†286-95; general data, 8-296-296-B**

- agriculture, 8-293, 294
- cotton, 8-\*291, 293
- tobacco, 8-287, \*290
- animal life
  - snakes, 3-502
  - squirrels, 4-368
  - toads, 3-426
  - turtles, 3-473
- area, 8-296
- boundary dividing from South Carolina, 8-351
- capital and capitol building, 8-\*286
- charities and correction, 8-296

**North Carolina, state, U. S.—continued**

- cities, 8-294-95
  - list, 8-296-B
- climate, 8-296, 293
- counties, list, 8-296-B
- education, 8-29†
- institutions of higher learning, list, 8-296
- flag, 8-296-A
- highways, 8-295
- history, 8-286-90, 291-92
  - division made between the Carolinas, 8-351
  - proprietary colony, 7-130; 8-350
  - signs Declaration of Independence, 7-173
  - Watauga Association, 8-368
- holidays, 8-296-A
- Indians, 8-288
- interesting facts, 8-296-A
- islands, 8-288
- location, 8-296
- map, 8-531
  - on United States map, 7-595
- monuments, 8-296-A
- motto, 8-296-A
- mountaineers, 8-291
- name, 8-296-A
- nicknames, 8-296-A
- parks, 8-296-A
  - Kitty Hawk National Park, 7-414
- physical features, 8-296, 290
- pirates, 8-288
- plant life, 8-294
- political facts, 8-296
- products and industries, 8-†293-95
  - early, 8-287
  - forests and products from, 8-\*292
  - minerals, 8-295
  - see also* agriculture *above*
- reservations, bird and game, 8-296 A
- rivers, 8-296
- state bird, 8-296-A
- state flower, 8-296-A
- state song, 8-296-A
- trade, 8-293
  - early difficulties, 8-287
  - transportation, 8-287, 295

**North Carolina, University of, Chapel Hill, N. C., 8-287, 295****North Channel, British Isles, map, 6-572****North Dakota, state, U. S., main article, description and history, 8-†298-301; general data, 8-302-302-B**

- agriculture, 8-†300
- area, 8-302
- capital and capitol building, 8-\*298
- charities and correction, 8-302
- cities, towns, list, 8-301, 302-B
- climate, 8-302
- counties, list, 8-302-A
- education, 8-301
- institutions of higher learning, list, 8-302
- flag, 8-302-A
- Glacial Age, 1-†61

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**North Dakota, state, U. S.- continued**

history, 8-299-300  
 admitted to Union, 8-300  
 alliance of territories before becoming a state, 8-299, 300, 442  
 holidays, 8-302-A  
 Indians, 8-299-300  
   reservations, 8-302  
 location, 8-302  
 map, 8-532  
   on United States map, 7-594  
 monuments, 8-302-A  
 motto, 8-302-A  
 name, 8-302-A  
 nicknames, 8-302-A  
 parks, 8-302-A  
 physical features, 8-298, 302  
 points of interest, 7-414  
 political facts, 8-302  
 products and industries, 8-300-1  
 reservations, game and bird, 8-302-A  
 rivers, 8-302  
 state bird, 8-302-A  
 state flower, 8-302-A  
 state song, 8-302-A  
 transportation, 8-300  
 "North Dakota State Song," 8-302-A  
 North Dakota, University of, Merrifield Hall, 8-299  
 North Downs, range of hills, England, 6-108-B  
 North Friesian Islands, North Sea, map, 6-599  
 North German Confederation, 6-229  
 North German Lloyd, steamers, 10-223, 224  
 North Holland Canal, 6-355-A  
 North Island, New Zealand, 5-541-B, \*531  
   map, 5-598  
 North Land, islands, Arctic Ocean, map, 6-602  
 North-man-dwelling, term for Normandy, 6-375  
 North Minch, channel, Scotland, map, 6-574  
 "North of Boston," poem by Frost, 13-349  
 North Pacific trade route, 10-241  
 North Park, Colo., 8-52-A  
 North Plains, U. S., 8-386  
 North Platte Bird Refuge, 8-228-A  
 North Platte River, U. S., 8-52-A  
 North Pole, exploration and search for, 13-490, †493-502  
   discovery, 13-500  
   reached by aircraft, 13-502  
   elevation, 1-25  
   ice, 1-61  
   length of day, 1-202  
   map, 13-502-A  
   of routes taken to, 13-\*500  
   position changing; its Pole Star, 1-178  
   relation of magnetic pole to: map, 10-†456  
   *see also* Arctic regions  
 North River, New York State, *see* Hudson River

**North Sea, Europe**

flood in thirteenth century, 6-353  
 map, 6-570  
 once dry land, 3-61  
 North Star, 1-178  
   Maine's coat of arms bears, 8-156-A  
   star maps  
     Jan. and Feb., 1-178-A  
     March and April, 1-178-C  
 North Star State, 8-198-A  
 North temperate zone, 1-204  
 North Truchas Peak, New Mexico, 8-262  
 Northampton, Treaty of, 6-116  
 Northampton County, Virginia, agriculture, 8-414  
 "Northanger Abbey," by Jane Austen, 13-208  
 Northeast Land, Arctic ocean, map, 13-502-A  
 Northeast Passage, search for, 13-475, 499  
 Northern Bronze Age, 12-16  
 Northern Clay Belt, Ontario, 7-29-Q  
 Northern frog, 3-\*423  
 Northern Hemisphere, 5-518-B  
 Northern Highland, range of hills, U. S., 8-446  
 Northern Ireland, ("The Six Counties") division of United Kingdom, 6-108-B  
   maps, 6-576  
   on map of Europe, 6-570  
 Northern, or Lower Kingdom, Egypt, 5-51  
 Northern lights (Aurora borealis), 1-†526  
   an electrical display, 1-526  
   effect of sun spots upon, 1-116  
 Northern, or Indo-European, people  
   beginnings in Persia, 5-97, †99, 103, 105  
   *see also* Aryan race; Nordic race  
 Northern Rhodesia, So. Africa, map, 5-577  
 Northern shrike, bird, 4-†229  
 Northern Territory, Australia, part of Commonwealth of Australia, 5-560-L  
 Northmen, people  
   explorations in America, 7-†110-12  
   Ireland, 6-146  
   migrations, 5-2†8; 6-393  
   possible settlement in Rhode Island, 7-\*112  
   prowess on the ski, 14-520  
   *see also* Normans; Norsemen; Scandinavians  
 Northumbria, Anglo-Saxon kingdom in Britain, Christianity in, 6-9  
 Northwest Angle, 8-198-A  
 Northwest Company  
   Canadian fur trade, 7-19; 10-139  
 Northwest Mounted Police, *see* Royal Canadian Mounted Police  
 Northwest Ordinance, U. S., 7-176  
 Northwest passage to India, 13-496, 499; 7-135; 8-150; 7-4  
 Northwest Territories, Can., 7-29-W-X, 33-B  
   government, 7-33-K, \*33-L  
   national park, 7-29-V  
 Northwest Territory, U. S., 8-182, 112  
   claims to; division into states 7-176  
   Clark's conquest, 8-97  
   English rule, 8-97  
   Ohio part of, 8-307

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Northwest Territory—continued**

slavery forbidden, 12-504

Wisconsin a part of, 8-442

**Northwestern University, 8-105****Norton Sound, Alaska, map, 8-560****Norway, country, Europe, description and history, main article, 6-†379-90; general data, 6-407-A; see also index World War II, 6-493**

Academy of Sciences founded, 6-388

agriculture, 6-\*388

area, 6-407-A

claim on Greenland, 6-482

climate, 6-407-A

common people, 6-386, 388

costumes, 6-\*383, \*387; 4-\*433; 9-\*2

divisions, 6-407-A

education, 6-390

emigration to Wisconsin, 8-442

fjords, 6-372, 374, \*382, \*383

fisheries, 6-\*382, 383

flag, color plate, 14-following 570, no. 49

government, 6-407-A

**history, 6-†379-90**

early emigration from, 6-380, 419

conquest and loss of Scottish islands, 6-380, 386

Haakon defeated by Scots, 6-\*112

throws off yoke of Denmark and Sweden, 6-381

peace offer to Sweden, 6-393

civil wars, 6-384

period of greatest power; end of independence, 6-386

Kalmar Union of Scandinavian countries, 6-388, 390, 396, 407, 411, 412

relations with Denmark, 6-382, 386, 393, 409, 410, 411, 414, 416

relations with Iceland, 6-418, 419

resistance to Swedish invasion, 6-388

Constitution, 6-389, 390

national assembly at Eidsvold, 6-\*389, 390

democratic progress; stand for peace, 6-390

separation from Sweden, 6-390, 407

invaded by Germany, 6-390

inland waterways, 6-\*385

literature; great writers, 6-390; 13-86, 98

drama, 12-333

location, 6-407-A

maps, 6-596

on map of Europe, 6-570

merchant marine, number, 10-232

music and musicians, 12-256, †303

people, 6-407-A

physical features, 6-407-A

progressive ideals, 6-390

religious history, 6-380, 381, 382, 388

rivers, 10-259

scenery, 6-\*372, \*383, \*385

sea power, 6-\*389

settlement of Iceland by, 6-418

sledge, 10-\*133

**Norway--continued**

winter sports, 2-417; 14-519, 521

woman suffrage granted, 6-390

**Norwegian literature, 6-390; 12-333; 13-86, 98****Nose**

color plate, 2-\*278

hot and cold spots, 2-292

protection of lungs, 2-336, 337

sense cells of smell, 2-308

**Nosebleed, treatment for, 2-403****Nostak River, Alaska, 8-16****Nostrils, spread when breathing, 2-340****"Not worth a Continental," meaning of term, 7-167****Notation, musical, 12-\*212, 213, \*214****Notre Dame, cathedral, Antwerp, 6-346; 11-\*92****Notre Dame, cathedral, Paris, 11-\*459, 460**

bas-reliefs, 11-\*97

carved doorway, 11-\*466

gargoyles, 11-†98-99, \*470

statues of the Virgin, 11-93, †94, \*95

**Notre Dame, church, Algiers, 11-\*453****Notre Dame, University of, Administration Building, 8-\*109****"Notre Dame de Paris," by Hugo, 13-†126****Nottingham, Lady, and Queen Elizabeth's ring, 12-396****Nova, João da, first to land on St. Helena, 6-491****Nova Scotia, prov., Canada, 7-†29-K-N, 33-A**

cranberry bog in, 9-\*157

French deported from, 7-8

Haliburton writes about, 13-574-75

history, 7-3, 13, 14, 19, 23; 13-568

map, 7-593

national park, 7-29-M

population, 7-33-A

resources and industries, 7-\*27, †29-L-N, 33-A

won by England, 7-7

**Nova Zemlya, island, Arctic Ocean, maps, 5-573; 6-602****Novae, stars, 1-174****Novara, Battle of, 1513, 6-250****Novara, Battle of, 1849, 6-308****Novels**

Defoe father of the modern novel, 13-177

earliest English, 13-186-88

early novels of the sea, 13-190

first historical novel, 13-222

first realistic, 13-188

naturalism in, 13-347

picaresque, 13-191

"problem" or "thesis," 13-347

"proletarian" or "Leftist," 13-355

sentimental, 13-187, 188

**November, ninth month, 10-482****Novgorod, Russia, 6-424 fol.**

Rurik and Askold take possession of, 6-375

**Novices, young monks in monastery, 5-308****"Novum Organum," by Francis Bacon, 13-152****"Now," words that mean, 10-23****N. R. A., see National Recovery Administration**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Nubia**, region, Africa, 5-61, 69  
**Nubian Desert**, Africa, map, 5-578  
**Nubian race**, 5-458  
**Nuclear fission**, *see* Atomic energy  
**Nucleolus** of cell, 2-\*7, \*279  
**Nucleus of atom**, 1-†541  
**Nucleus of cell**, 2-†7, \*279  
     in cell division, 2-\*9, 10  
**Nucleus of comet**, 1-162  
**Neuva Gerona**, capital of Isle of Pines, 7-57  
**Nuevo Leon**, state, Mexico, map, 7-597  
**Nugget**, gold, 9-393  
**Nullification**  
     by South Carolina, 7-224, 225  
     controversies over, 7-224  
     Virginia and Kentucky Resolutions, 7-199  
**Nullipores**, algae, in coral reefs, 1-56  
**Numa Pompilius**, legendary king of Rome, 5-204  
**Numbers**, early methods of writing, 10-†421-23  
**Numerical coefficient**, algebra, 10-433  
**Numitor**, legendary grandfather of Romulus and Remus, 5-197  
**Nummulites**, shells, 3-51  
**Nun buoys**, 10-\*227  
**Nunivak Island Wild Life Refuge**, 8-16-B  
**Nuns and nurseries**, 5-278  
     lace making, 12-164, 166, 172  
**Nuremberg**, Germany, 5-\*309; 11-207  
     battlement, 7-\*351  
     location, 10-257  
     map, 6-582, 104  
     Nazi party congress, 6-\*494  
     tomb of Saint Sebaldus, 12-†22  
     war crimes trial, 6-\*241-A  
**Nuremberg, Peace of**, 6-213  
**Nuremberg egg**, watch, 10-468  
**"Nurse and Child, A,"** painting by Frans Hals, 11-\*262, 264  
**Nursery Rhymes**, *see* Mother Goose

**Nurses and nursing**  
     Red Cross, 7-\*425, \*427-28  
     settlement nurses, 7-440  
     war nursing  
         during Crimean War, 7-426, \*429  
         started by Florence Nightingale, 6-99  
**Nursing**, term in billiards, 14-482  
**Nutcracker**, mechanical principles, 1-†327  
**"Nutcracker Suite,"** music by Tschaikovsky, 12-255  
**Nuthatch**, bird, 4-†125, 126, \*129  
     color plate, 4-\*89  
     *see also varieties of nuthatch, as* White breasted nuthatch  
**Nutmeg**, 9-208, \*209; 2-\*124  
**Nutmeg pigeon**, 4-\*79  
**Nutmeg State** (Connecticut), 8-62; 9-208  
**Nutria**, hats made of, 9-89  
**Nutrition**  
     body's use of food, 2-†360-67  
     digestive process, 2-†352-58  
     in soybean, 9-214-A  
     laboratory studies with guinea pigs, 2-\*390  
**Nuts, food and products**, main article, 9-†201-4  
     a kind of fruit, 2-122  
     almonds not true nut, 9-204  
     canning, 9-\*204  
     peanuts not true nut, 9-204  
     pine, 2-97  
     stamping of, 9-\*203  
     trees producing, 2-159  
     *see also names of various nuts, as* Walnut  
**Nuwara Eliya**, plateau in Ceylon, 5-387-B  
     Nyasa, lake, Africa, 5-462; 13-553, 554  
     map, 5-577  
**Nyasaland**, protectorate, Africa, 5-461  
**Nylon**, 9-86; 10-553  
**Nymphs**, insect larva, 3-\*274, 372, 388, \*389  
**Nymphs**, mythology, 14-437



**O** in Irish names, meaning of, 6-149  
**"O Captain, My Captain,"** by Walt Whitman, 13-327  
**"O Fair New Mexico,"** song, 8-262-A  
**O. Henry**, *see* Porter, William Sydney  
**"O Pioneers,"** novel by Willa Cather, 13-352  
**"O Tannenbaum,"** German tune used in "My Maryland" 8-162-B  
**Oahu**, island of Hawaiian group  
     area, 8-461  
     map, 8-562  
**Oak, tree**  
     age of various species, 2-260  
     classification of Linnaeus, 2-183, 184  
     cork from, 9-296  
     kinds, 2-160

**Oak, tree—continued**  
     leaf under microscope, 10-\*487  
     Miocene period, 3-53  
     outer bark, 2-30  
     root, 2-38  
     stem, 2-†29, 31  
     water content of leaves, 2-259  
     white, 2-\*271  
     wood, 9-258; 2-159  
         furniture of, 12-182, †184-85, 188  
**Oak apples**, 9-\*304, 307; 3-\*274  
**Oak leaf**, Gothic decoration, 12-182  
**Oak poisoning**, treatment, 2-403  
**Oak Ridge**, Tenn., plant for atomic fission, 7-\*527  
**Oak toad**, 3-426  
**Oakum**, use, 9-313  
**Oarfish**, 3-\*199

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Oars**, of boat, 14-532  
 use of, with sails, 10-\*162, †163
- Oases**, in the Sahara Desert, 5-453  
 Egypt, 5-73-B
- Oates, Lawrence Edward Grace**, death, 13-510
- Oaths**  
 Hippocratic, used by physicians, 13-358  
 president's oath of office, U. S., 7-186  
 Scout, 14-543
- Oats**, 9-†119
- Oaxaca**, state, Mexico, map, 7-597
- Ob River**, Asia, 5-336-B  
 basin area, 10-257  
 length, 10-253  
 maps, 6-600, 602; 5-580
- Ob River Valley**, 6-443-A
- Obelia**, hydroid, 3-\*105
- Obelisks**  
 as sundial pointers, 10-\*468  
 Egyptian, 5-†63; 11-412  
 Central Park, N. Y., 10-\*39
- Oberammergau**, Passion Play, 12-327, †328
- "Oberon,"** opera by Carl von Weber, 12-250, 282  
 clarinet passages, 12-258-B
- Obesity**, cause of, 2-356
- Objibway settlement**, Ontario, 7-29-Q
- Oblique angle**, geometry, 10-438
- Oboe**, musical instrument, 12-258-A
- Oboe family of musical instruments**, 12-258-A
- Obregon, Alvaro**, president of Mexico, 7-87
- Observation**, game, 14-164
- Observatories, astronomical**, main article, 1-†185-91  
 clear atmosphere necessary for, 1-190  
 earth conditions recorded, 1-190  
 importance of situation, 1-190, 183  
 locations  
 Arequipa, Peru, 5-\*507  
 Flagstaff, Ariz. (Lowell), 1-183; 13-407  
 Greenwich, England, 1-158  
 Mount Hamilton, Calif. (Lick), 1-\*105  
 Mt. Palomar, Calif., 1-\*189  
 Pasadena, Calif. (Mt. Wilson), 1-\*188, \*189  
 ruins of Tycho Brahe's at Hveen, 6-414  
 Williams Bay, Wis. (Yerkes), 1-154, \*189
- Obsidian**, natural glass, 7-69
- Obstacle race**, game, 14-168
- Obtuse angle**, geometry, 10-438
- Obtuse triangle**, geometric figure, 10-439
- Occupational guidance**, *see* Vocational guidance
- Ocean**, main article, 1-†66-67 (*see also entries under main subjects listed below*)  
 action of, on rocks, 3-4; 1-\*69, †70, \*71, \*72  
 animal life in, 3-†72-215 (*see also* Contents Volume 3)  
 coral 3-†97-102, \*69  
 crustaceans, 3-†174-92  
 fishes, 3-†194-215, 244-52; *see also* Shellfish  
 fishes caught for food, 9-†366 fol.  
 Foraminifera, 3-†77-80  
 marine worms, 3-†117-26  
 mollusks, 3-†141-62
- Ocean, animal life in—continued**  
 moss animals (Bryozoa), 3-†114-15; 10-\*489  
 octopus, 3-†166-72  
 prehistoric, 3-33  
 Cambrian period, 3-9, 10  
 Carboniferous period, 3-29, 30  
 crustaceans, 3-10, 18, 24  
 Devonian period, 3-9, \*14, 21 fol.  
 mollusks, 3-9, 15, 18, 24, 64  
 Ordovician period, 3-12 fol.  
 Silurian period, 3-10, 18, 19  
 scent production, 3-84, 114, 117  
 sea anemones, 3-\*69, color plate, 87, †89-95  
 sea cucumbers, 3-†138-39; 10-\*488  
 sea firs, hydroids, and jellyfish, 3-†104-14  
 sea-dwelling mammals  
 seals, 4-†327-35  
 whales, dolphins, porpoises, 4-†441-48  
 sea urchins, 3-†135-38  
 sponges, 3-†82-87  
 starfish, 3-†128-35, \*139  
*see also classes and names of sea creatures, as*  
 Crabs; Hermit crab  
 Antarctic, map, 13-502-B  
 Arctic, maps, 13-502-A; 5-572  
 Atlantic, *see* Atlantic Ocean  
 beauty and wonders in, 3-†72-76, 100  
 color plates, 3-86, 87, 142, 198, 199, 214  
 beginnings of plant and animal life, 3-6  
 Brownson's Deep, 7-50  
 Caspian Sea once part of, 1-44  
 continental shelf, 1-69, 9-364  
 currents, *see* Ocean currents  
 first on earth, 1-49  
 floor, 1-†66-67; 3-44, \*74, 76, 89 fol.  
 color plate, 3-\*70  
 upheaval, 1-21  
 fogs, 1-242  
 highway of civilization, 10-163  
 highway for trade, 10-†231-42  
 importance as, 7-572  
 icebergs, 1-59, 63, 64, 242, 472; 10-\*418  
 Indian, map, 5-573  
 light and temperature in depths 1-66  
 lost ocean, 3-35  
 measurement of depth, 10-374  
 Pacific, *see* Pacific Ocean  
 plant life, 2-†66-69; 1-56  
 phosphorescence of, 2-18  
 prehistoric  
 Himalaya region, 5-432  
 North America, 8-180  
 pressure upon depths, 1-67  
 proportion of earth covered, 1-364  
 rising and sinking of coast, 1-†69-72  
 salt contained in, 1-44, 70; 3-74; 9-411  
 salts in solution, 3-†78  
 sea charts, 10-304  
 sediment contributed by streams, 1-49  
 size and depth, 1-†66  
 soundings and what they tell, 1-64

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Ocean**—*continued*

- submarine cables in, 10-†101-6
- tides, 1-†133 fol., 9; 9-440
- time keeping at sea, 10-468, 473, 300
- topography, 1-67; 3-74
- undulating plain between Ireland and Newfoundland, 10-102
- undersea quakes, 1-80
- volcanoes in, 1-76
- waves, 1-69, 70, 72, 80, 360, 439; 3-4
- "Ocean The," by Leonid Andreyev, 13-97
- Ocean currents**, 1-67
  - Humboldt or Peruvian, 5-518-19
  - Japan Current, 1-223
  - Tsushima Current, 5-364-B
- Ocean diving**, 10-\*521-26
- Ocean greyhound**, name for steamships, 10-293
- Ocean Grove**, N. J., resort, 8-246
- Ocean highway and its traffic**, main article, 10-†231-42
- Ocean liners**, *see* Steamboats and steamships
- Ocean Springs**, Miss., founded, 8-201
- Oceanus**, god, 14-435
- Ocelli**, of insects, 3-273, 279
- Ocelot**, animal, 4-†294
- Ocmulgee National Monument**, 8-84
- Ocmulgee River**, Ga., 8-84
- Ocoee**, flower, *see* Passion flower
- Oconee River**, Ga., 8-84
- O'Connell, Daniel**, Irish patriot, 6-158, 162
- O'Connell Street**, Dublin, 6-162
- Oconto River**, Wis., 8-446
- Ocracoke Inlet**, pirate sea fight, 8-288
- Octagon**, geometric figure, 10-439
- Octavia**, mother of Marcellus, 13-\*48
- Octavia**, sister of Augustus, wife of Mark Antony, 12-361
- Octavian**, 12-362; *see also* Augustus (Gaius Julius Caesar Octavianus), Roman emperor
- October**, eighth month, 10-482
- October Diploma** (Austrian), 6-271
- Octopus**, 3-†166-69, 171, 172
  - compared with other mollusks, 3-\*168
  - eggs and hatching, 3-169
  - motif in Cretan pottery, 12-†48
- "**Octopus, The**," novel by Frank Norris, 13-346
- Ocular**, of microscope, 10-\*486
- "**Ode to Jersey**," song by Dr. Elias Carr, 8-252-A
- "**Ode to the West Wind**," by Percy Bysshe Shelley, 13-229
- Odenwald**, German forest, 6-241-B
- Oder**, river, from Carpathian Mts. in Moravia, Czechoslovakia, through Germany, to Baltic Sea, 10-258
  - Czechoslovakia, 6-290-A
  - length, 10-253
  - map, 6-583
- Odessa**, Russia, 10-261
  - map, 6-601, E5
- Odets, Clifford**, dramatist, 13-355

- Odin** (Woden), god, 6-376, 377
  - Christianity replaces worship, 6-381
- Odo**, king of the West Franks, 6-\*168
- Odoacer**, barbarian ruler of Italy, 6-293
  - conquest of Italy, 5-268; 6-206
- Odometer**, instrument for registering distance, 10-\*440
- O'Donnell, Hugh** (Red Hugh), rebellion headed by, 6-153
- O'Donnell family**, Irish leaders, 6-149
- Odors**
  - classification, 2-308
  - food, effect upon taste, 2-307
  - pungent, of foliage, 2-175
  - see also* Perfume
- Odysseus**, *see* Ulysses
- Odysseus and Ajax**, Greek painting, 11-36
- "**Odyssey, The**," by Homer, 13-27; 5-152
  - résumé of story, 13-29-30
  - translation by Richard Wagner, 12-293
- Oedipus**, king of Thebes, 14-†444
- "**Oedipus at Colonus**," by Sophocles, 13-36
- "**Oedipus Rex**" ("**Oedipus Tyrannus**"), by Sophocles, 13-36
- Oersted, Hans Christian**, scientist, 1-491, 504
- "**Of Thee I Sing**," drama, 13-355
- "**Of Time and the River**," novel by Thomas Wolfe, 13-352
- Offa**, king of Mercia, 6-138
- Offa's Dyke**, boundary of Wales, 6-138
- "**Offering**," painting by Rivera, 11-392-B
- Office of National Parks, Buildings, and Reservations**, 7-411
- Office of Price Administration**, 7-343, 343-A
- Officer bird** (red-winged blackbird), 4-†45-46
- Officers**, U. S. Army, 7-477
- Ogden, C. K.**, and Basic English, 10-7
- Ogden, William**, 10-413
- Ogden, Utah**, 8-\*395
  - industries, 8-395
  - meeting of first transcontinental railway lines, 7-†278
- Ogeechee River**, Ga., 8-84
- Oglethorpe, James Edward**, General, 8-78
  - university named for, 8-84
- "**Ohio**," origin of word, 8-312-B
- Ohio**, state, U. S., **description and history**, main article, 8-†304-12; general data, 8-312-A-313
  - agriculture, 8-306 fol.
  - area, 8-312-A
  - canals, 8-308
  - capitol, 8-\*304
  - charities and correction, list, 8-312-A
  - cities, towns, list, 8-309, 310, 311-12, 312-B
  - climate, 8-312-A
  - counties list, 8-312-B
  - education, 8-312
  - institutions of higher learning, list, 8-312-A
  - state university, 8-305
  - flag, 8-312-B
  - Glacial Age, 1-†61; 8-307

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Ohio, state, U. S.—continued**

- history, 8-305-7
  - admitted to Union, 8-307
  - boundary line quarrel with Michigan, 8-183
- holidays, 8-312-B
- Indians, 8-304-6
  - mounds left by, 7-†96; 8-304
- location, 8-312-A
- map, 8-535
  - on United States map, 7-595
- monuments, 8-312-B
- motto, 8-312-B
- name, 8-312-B
- nicknames, 8-312-B
- oldest building in, 7-†215
- parks, 8-312-B
- physical features, 8-307-8, 312-A
- political facts, 8-312-A
- products and industries, 8-307 fol.
  - dependence on East Indies for rubber supply, 7-578
  - minerals, 8-308, 311, 312
  - rubber manufacture, 8-312; 9-271
  - see also above subhead* agriculture
- rivers, 8-304, 307
- settlers, 8-306-7
- state bird, 8-312-B
- state flower, 8-312-B
- state song, 8-312-B
- transportation, 8-308, 310
  - river, 8-307, 310

**Ohio and Erie Canal, 8-308****Ohio Company, first and second, 8-306****Ohio Land Company office, 7-†215****Ohio River, U. S., 8-304**

- construction program, 8-312
- Illinois, 8-106
- importance; peopling of its valley, 7-213
- Indian name for the Mississippi, 13-486
- Indiana, 8-116
- junction of Allegheny and Monongahela, 8-341
- length, 8-138-A
- map, 7-595
- name, 8-312-B
- Ohio, 8-312-A
- scene on, 10-†258
- state named after, 8-307
- steamboat, 8-†435
- transportation on, 8-304, 308, 310
- West Virginia, 8-436-A

**Ohio State University, 8-†305****Ohm, Georg Simon, discoveries in electricity, 1-515, 516****Ohm, unit of electrical resistance, 1-515****Ohthere, voyages of, 13-494****Oil, animal, mineral, vegetable, *see* Oils****Oil, petroleum, *see* Petroleum****Oil-burning furnace, 10-†382****Oil City, 8-319****Oil control rings, Diesel engine, 10-†276****Oil gauge, of automobile, 10-†288****Oil glands**

eye, 2-†292

skin, 2-289, 291

**Oil jars and jugs, 12-†49, 50****Oil lamps, 10-†388**

used in lighthouses, 10-226, 228

**Oil of cloves, 9-209****Oil of turpentine, 9-313****Oil refinery, Mexico, 7-†87-A****Oil State, nickname for Pennsylvania, 8-342****Oil tanker, 10-†235, †240****Oiling of machinery, 1-382****Oils**

calm waves, 1-360; 10-416

cod liver, 3-211

cottonseed, 9-34

derived from date seeds, 2-119

derived from palms, 9-190

extracted from flowers, 9-299, 300-2

friction reduced by, 1-320

lamps, 9-450; 10-389

olive, 9-213

plants waterproofed by, 2-32

soy bean, 9-214

tung, 9-312

uses, 10-547

flavoring, 9-311

glazes for preserving pictures, 11-198

motor engine lubrication, 10-†288

tanning, 9-70

vegetable oils, 9-312

whale oil, 4-441, 446

*see also* Fat, and names of oils, as Cottonseed**Oinochoë, wine pitcher, 12-50****Ojeda, Alonso de, 5-496****Ojibwa Indians, *see* Chippewa Indians****Ojin, legendary Japanese hero, 5-344****Okanogan Highlands, U. S., 8-428****Okanogan Mountains, U. S., 8-428****Okapi, animal, 4-405, †406****Okeechobee, Lake, Florida, 8-76**

Indian reservation, 8-76-A

**Okefenokee Swamp, Georgia and Florida, 8-76****O'Keeffe, Georgia, painting by, 11-†392-B****Okhotsk, Sea of, Asia, maps, 6-603; 5-573****Oklahoma, state, U. S., description and history, main article, 8-†315-20; general data, 8-320-A-321**

agriculture, 8-†318, 316

cotton, 8-†320

dust storms affect, 8-318

American Dust Bowl, 7-466

Holland grass binds sand, 7-†466

area, 8-320-A

charities and correction, list, 8-320-A

cities, towns, list, 8-319, 320-B

climate, 8-320-A

counties, list, 8-320-B

drought, 8-318, 319

education, 8-320

institutions of higher learning, list, 8-320-A

University of Oklahoma, 8-316

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Oklahoma—continued**

- flag, 8-320-B
- history, 8-315, 318
  - Houston pacifies Indians, 12-515-16
- holidays, 8-320-B
- Indians, 8-317; 7-\*101
  - reservations, 8-320-B
- location, 8-320-A
- map, 8-536
  - on United States map, 7-594
- motto, 8-320-B
- name, 8-320-B
- nicknames, 8-320-B
- parks, 8-320-B
  - Platt National Park, 7-409
- physical features, 8-316, 320-A
- political facts, 8-320-A
- products and industries, 8-318
- reservations, game and bird, 8-320-B
- rivers, 8-320-A, 316
- state bird, 8-320-B
- state flower, 8-320-B
- state song, 8-320-B
- transportation, 8-320
- Oklahoma, University of**, 8-316
  - business administration building, 8-\*316
- Oklahoma City**, Okla., industries, 8-319
  - oil wells, 8-\*317
  - temperature, 8-320-A
- Oklawaha River**, Florida, 8-76
- Okra**, vegetable, 9-150
- Olaf I, Tryggvesson**, king of Norway, reign, 6-381
  - defeat by Denmark and Sweden, 6-393, 409
- Olaf II, Haraldsson, Saint**, king of Norway, reign; forces Christianity upon Denmark, 6-381, 382
- Olaf III, Kyrre**, the Quiet, king of Norway, 6-384
- Olaf**, king of Sweden, defeat of Norway, 6-393
- Olaf Hakonsson**, king of Denmark and Norway, 6-411
- Olavinlinna, Castle of**, Finland, 6-\*456
- Old Age Pension**
  - Jane Addams advocates, 12-581
- Old Baloo**, sloth bear of India, 4-318
- "Old Battersea Bridge,"** painting by Whistler, controversy over, 11-320
- "Old Black Joe,"** song, 8-138-B
- Old Brussels point**, lace, 12-171
- "Old Bush Songs,"** Australian ballads, 5-560-F
- Old Castile**, province, Spain
  - climate, 6-342-A
- Old Colony**, part of Massachusetts, 8-176-B
- "Old Curiosity Shop, The,"** by Dickens, 13-†245
- Old Dominion** (Virginia), 8-418-A
- "Old Dutch Church, New York,"** painting by Edward L. Henry, 11-\*369
- Old English** (Anglo-Saxon), 10-11
  - Beowulf written in, 14-318
  - page from Anglo-Saxon Chronicle, 5-\*311; 10-\*10

- Old English sheep dog**, 4-\*497
- "Old Faithful,"** geyser, 1-\*33, 36
- "Old-Fashioned Girl, An,"** by Louisa May Alcott, 13-321
- "Old Father Time"** (Saturn), 1-155
- "Old Glory,"** flag, 14-\*574
- Old guard of Napoleon**, 11-\*488; 12-\*429
- Old Hawkeye**, nickname for J. G. Edwards, 8-124-A
- Old Hickory** (Andrew Jackson), 12-512; *see also* Jackson, Andrew
- "Old Ironsides"** (U.S.S. "Constitution"), 7-210; *see also* "Constitution"
- "Old Ironsides,"** by Oliver Wendell Holmes, 13-309
- "Old King Cole,"** nursery rhyme, color plate, 14-174-J
- "Old Lady Peeling a Pear, An,"** painting by David Teniers, 11-\*265
- "Old Lexicographer, The,"** picture, 10-\*17
- Old Line State**, nickname for Maryland, 8-162-B
- Old Manse**, at Concord, Mass., 13-\*304
- Old moon**, 1-126
- "Old Mother Hubbard,"** nursery rhyme, color plate, 14-174-I
- "Old New Hampshire,"** song, 8-242-B
- Old Noll the Roundhead** (Oliver Cromwell), 12-406
- Old North Church**, Boston, 11-\*508
- Old North State**, nickname for North Carolina, 8-296-A
- "Old North State, The,"** song, 8-296-A
- Old Orchard**, Maine, beach, 8-155
- Old Pretender**, *see* James Francis Edward Stuart
- Old Red Sandstone**, fossils in, 3-21, 22
- Old St. Paul's Church**, New York, 11-\*503
- Old Ship Church**, Hingham, Mass., 11-499
- "Old Silvernails"** (Peter Stuyvesant), 8-272
- "Old Sod, The,"** painting by William Magrath, 11-\*367
- Old South Church**, Boston, 11-\*502
- Old Spanish Trail**, 8-393
- Old State House**, Boston, Mass., 7-\*364; 8-\*166
- Old Stone Age**, civilization, 5-†23-33; 11-2
  - art, 11-†1-4; 5-\*6, 7
  - carvings, 12-95, \*106
  - implements, 11-†2
  - pottery, 12-47
  - Spain, 6-317
  - see also* Stone Age
- Old Swede Church**, Philadelphia, 11-499
- Old Testament**, *see* Bible
- Old Town**, Maine, canoe making, 8-155
- "Old Virginia,"** song, 8-418-A
- Old Weather Prophet**, rock, New Brunswick, 1-\*54
- "Old Woman Cutting Her Nails, An,"** painting by Rembrandt, 11-\*276
- "Old Woman in Meditation,"** painting by Gabriel Metsu, 11-\*260

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- "Old Woman Who Lived in a Shoe," nursery rhyme, color plate, 14-174-J
- "Old Woman with a Boy, An," painting by Murillo, 11-\*255
- "Old Wooden Leg" (Peter Stuyvesant), 8-272
- Oldenburg, house of, Denmark, 6-412, 416
- Oldenburg, state, Germany, map, 6-582
- "Ole Swimmin' Hole and 'Leven More Poems, The," by James W. Riley, 13-338
- Oleg, Norse chief, 6-424
- Oleo oil, 9-372
- Oleo stearine, in margarine, 9-373
- Oleo stock, in margarine, 9-373
- Oleomargarine, main article, 9-†372-73
- Olebresin (crude turpentine), 9-311, 313
- Oligarchy, Greek, 5-175
- Oligocene period, 3-51, 52
- forms of life in, table, 3-64
- rock formations, table, 1-40
- Olivárez, Gasparo de Guzmán, duke, and Velasquez, 11-249
- Olive tree, extreme age, 2-260
- Oliver, James, plows, 7-452
- Oliver, in legend of Roland, 14-338
- "Oliver Twist," by Dickens, 13-245
- Olives and olive oil, 9-†213
- oil used in lamps, 9-450
- Portugal, 6-\*339
- Olm, blind salamander, 3-†431
- Olustee, Battle of, 8-71
- Olympia, reconstruction, 5-\*167
- games held at, 5-154
- Olympiad, Greek chronology, 5-154
- Olympias, queen of Macedon, mother of Alexander the Great, 12-346
- Olympic elk, protection for, 8-428-A
- Olympic games
- Greek, 5-143, 154; 14-471
- Greek history thought to begin with, 5-143
- modern, 14-471, 475; 12-555-J
- Olympic Mountains, Washington, 8-428
- Olympic National Park, 8-428-A
- Olympic Peninsula, Washington
- mountains, 8-428
- national park, 8-428-A
- Olympus, Mount, Greece, 14-407
- gods and goddesses, 14-†407-12
- legendary location, 1-\*101
- Olympus, Mount, Washington, height, 8-428
- Omaha, Neb., 8-†226 \*227
- industries, 8-226
- temperature, 8-228
- transportation, 8-226, 227
- Oman, state, Asia, maps, 5-583, 580
- sultanate, 5-401
- Omar I, caliph, 5-397
- Omar Khayyam, life and work, main article, 13-89
- Omayyads, dynasty of caliphs, 5-398
- Omnibus, 10-\*145
- meaning of word, 10-22
- Omnibus—continued
- motor bus, 7-†399; 10-\*279, 281
- steam bus, 10-277
- Omnibus Bill, 12-456-C
- "Omoo," by Herman Melville, 13-325
- O'More, Rory, 6-155
- Omri, king of Israel, 5-124
- "On a Grecian Urn," by Keats, 13-232
- "On the Banks of the Wabash Far Away," song, 8-116-A
- "On the Crown," by Demosthenes, 12-345
- "On the Origin of Species," by Darwin, 13-431, 434, 436
- "On the Subjection of Women," by J. S. Mill, 13-239
- "On the Threshold," statue by Edith Burroughs, 11-\*373
- Onager, wild ass, 4-\*509
- Oñate, Juan de, Spanish explorer and colonizer of New Mexico, 8-255, 258
- inscription by, 8-262-A
- "One Big Union," 7-562
- One-celled organisms, see Unicellular organisms
- "One-Horse Shay" (The Deacon's Masterpiece), by Oliver Wendell Holmes, 13-309
- One-horse shay, Norwegian, 6-\*384
- One-wall handball, 14-486
- Onega River, Russia, Bacha Lake to Onega Bay, map, 6-600
- Oneida, Lake, New York State, 8-283
- Oneida Indians, members of Iroquois League, 8-269
- O'Neill, Eugene, dramatist, 13-354
- portrait, 13-\*347
- O'Neill, Hugh, earl of Tyrone, Irish patriot, 6-153
- O'Neill family, Irish leaders, 6-149, 153, 154
- Onion, 9-\*149, 150; 2-\*32
- Texas crop, 8-\*384
- Onion bulb, 2-33; 9-\*149
- "Only a Fiddler," by Hans Christian Andersen, 13-85
- Onoclea sensibilis* (sensitive fern), 2-\*91
- Onondaga Indians, in Iroquois League, 8-269
- Ontario, province, Canada, 7-29-O-Q, \*23, \*29-C, 33-B; map, 7-593; population, 7-33-B
- history, 7-14, 16-18, 29-L; 13-569-70
- national parks, 7-29-Q
- resources and industries, 7-†29-O-Q, \*26, \*28
- Ontario, Lake, No. Am., area, 8-283; map, 7-595
- discovery, 7-3
- Welland Canal to Lake Erie, 10-274
- Ontario Society of Artists, 13-582
- "Onward, Christian Soldiers," by Arthur Sullivan, 12-319
- Onyx glass, ancient, 12-29
- Ooze, ocean, 1-67; 3-76
- Foraminifera shells form, 3-14, 44, 77, 79; 1-51
- Globigerina in, 3-79
- Radiolarian, 3-14, 80; 1-52
- Opals, color plate, 9-frontispiece, 433

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Opaque substance**, 1-427, †428  
**"Open door policy,"** China, 7-301  
**Open-hearth process**, steel making, 9-†405  
**"Open Sesame,"** magic words in "Ali Baba and the Forty Thieves," 14-362  
**Open shop**, 7-563  
**Opera**, music  
   American, 12-257  
   beginnings, 12-223 fol.  
   first produced, 12-223  
   Gilbert and Sullivan's, 12-319, 320  
   Gluck's innovations, 12-237, 271  
   modern, 12-250-55, 256, 257  
   Wagnerian, 12-249-52, 294  
   *see also names of operas, as "Boheme, La"; "Carmen"; "Parsifal" and names of composers, as Verdi, Wagner*  
**Opera buffa**, music, 12-237  
**Opera house**  
   at Riga, Latvia, 6-\*460  
   first, 12-224  
**Operations**, surgical, success in, 2-\*369  
**Operculum**, zoology  
   marine worm, 3-121  
   top shell, 3-142  
   whelk, 3-\*147  
**Opium**, drug, 9-217, 18  
   trade, in China, 5-331  
**"Opium Eater, Confessions of an English,"** by De Quincey, 13-233  
**Opium poppy**, 9-217  
**Opium War**, 5-331  
**Oporto**, Portugal, wine named after, 6-342-A  
**Opossum shrimp**, 3-188  
**Opossums**, American, 4 \*468, †469  
   Australian, 4-\*467, †468-69  
**Oppenheimer, J. Robert**, physicist, 1-558-11  
**Opsonin** formed by blood, 2-350  
**Optic chiasma**, anatomy, 2-\*300  
**Optic lobes**, anatomy, 2-386  
**Optic nerve**, 2-\*296, \*299, \*300, \*385  
**Optical doubles**, astronomy, 1-174  
**Optimism**, Leibnitz' philosophy of, 13-15  
**Optimist**, meaning, 13-23  
**Or San Michele**, Church of, Florence, 11-124  
   carvings, 11-128  
**Oracle of Delphi**, 5-\*148, 154; 14-443  
**Orange-utans**, apes, 4-†247-48  
**Orange**, color, color plate, 1-\*434  
   dye, 9-447  
**Orange**, California's industry, 9-†170-74  
   citric acid, 9-175  
   factors involved in industry, economic point of view, 7-568  
   Florida's industry, 9-\*171, 173  
   frost, 9-174  
   fruit, 2-\*118; 8-\*71  
   generic name, 2-183  
   grove in California, 1-\*207, \*277; 7-\*460  
   growing season, 2-256  
   navel or seedless, 9-173, 175; 2-\*230  
   sweet and bitter, 9-172  
**Orange—continued**  
   vitamins, 2-365  
   wild; breeding of, in America, 9-172  
**"Orange,"** change in spelling of word, 10-22  
**Orange**, Texas, chemical plant near, 8-\*383  
**Orange**, Fort, name changed, 8-274  
**Orange blossom**, Florida's state flower, 8-76-A  
**Orange Free State**, prov., Union of South Africa  
   history, main article, 5-†484-91\*  
   beginning of, 5-481  
   made a republic, 5-482  
   Boer Wars, 5-487; 6-101  
   annexed to British empire, 5-488  
**Orange marmalade**, 9-172  
**Orange pekoe tea**, 9-136  
**Orange River**, principal river of South Africa, rising in Basutoland, flowing West to Atlantic Ocean, 5-491-B, 473-A  
   basin area, 10-257  
   length, 10-253  
   map, 5-577  
**Orange Society**, Ireland, 6-158  
**Orange State**, nickname for Florida, 8-76-A  
**"Oration on Makers of the Flag,"** text, 14-569  
**Oratorio**, music, 12-223  
   Handel, 12-232, 265  
   Mendelssohn, 12-245  
**Orators**  
   Cicero, 13-†46-47  
   Demosthenes, 12-†344-45  
   Henry, Patrick, 12-†482-83  
   in House of Commons, 13-201, 206, 234  
   Webster, Daniel, 12-†520-21  
**Orb weaving spiders**, 3-408, †409, \*412  
**Orbital cavity of skull**, 2-\*298  
**Orbits**  
   earth, 1-13  
   planets, 1-106, †289  
**Orchard**, 7-\*462  
   care and management, 9-†163-64  
   frost protection, 9-163  
**Orchard fruits**, main article, 9-†161-68  
**Orchard oriole**, bird, 4-26  
**Orchestra**, seating plan, 12-\*248  
   "battery" of, 12-258-C  
   broadcasting, 10-\*119  
   "color" from, 12-237  
   compositions for, 12-225  
   early seventeenth century, 12-223  
   musical instruments in, 12-258-258-E  
   sounds when turned, 2-305  
**Orchid**, flower, insect that resembles, 3-350  
**Orchid family**, 2-\*151, 152  
   lady's slipper member of, 8-198-A  
**Ordeal**, Indian, 7-106  
**Ordeal**, trial by, replaced with jury, 6-21  
**"Ordeal of Richard Feverel, The,"** by George Meredith, 13-263  
**Orders**, in architecture, 11-\*416, 418 fol., 430, 432  
   Composite, 11-432

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Orders—continued**

diagram, 11-418

used by Romans, 11-430, 432

**Orders in Council**, British, 7-196, 208, 210

**Ordovices**, British tribe, 3-12

**Ordovician period**, 3-†12-15

forms of life in, table, 3-64

plant life, 3-14

rock formation, table, 1-†40

**Ore**

containing silver, 9-389

iron, 9-399

refining industry of United States, 7-343-F

smelting

copper, 9-417

iron blast furnace, 9-†400, 401, †402, †404

**Orebro**, Sweden, castle, 11-478

**"Oregon,"** meaning of word, 8-332

**Oregon**, state, U. S., description and history, main article, 8-†323-30; general data, 8-331-32-A

agriculture, 8-328, 329

irrigation, 8-329

area, 8-331

capitol, 8-323

charities and correction, list, 8-331

cities, towns, list, 8-332-A

climate, 8-331, 327

counties, list, 8-332-A

education, 8-330

institutions of higher learning, list, 8-331

flag, 8-332

history, 8-326-27

admitted to Union, 8-327

Canadian boundary controversy, 8-326, 327

dispute over question of ownership, 7-234, 236

early fur trade and settlement, 7-231, 232, 233

foundation of claim to, 7-207

leads way in political reforms, 7-312

holidays, 8-332

Indians, 8-327, 328

reservations, 8-332-A

location, 8-331

map, 8-538

on United States map, 7-594

monuments, 8-332

motto, 8-332

name, 8-332

nicknames, 8-332

parks, 8-332; 7-407

physical features, 8-324-25, 331

"Pillar of Hercules," rock formation, 1-21

political facts, 8-331

products and industries, 8-†328-30

dairying, 8-327, 329

fruit growing, 8-326, 329; 9-162, 166

lumbering, 9-257

menthol, 9-219-A

minerals, 8-328

reservations, game and bird, 8-332

**Oregon—continued**

ivers, 8-325

state bird, 8-332

state flower, 8-332

state song, 8-332

transportation, 8-330

**"Oregon,"** U. S. battleship, 7-483

**"Oregon, My Oregon,"** song, 8-332

**Oregon**, Territory of, organized, 8-327

**Oregon**, University of, Administration Building, 8-324

**Oregon Caves National Monument**, Josephine County, 8-332

**Oregon country**

Idaho part of, 8-88

map, 7-206

**Oregon grape**, 8-332

**Oregon Trail**, emigrants, 8-88, 449

**Orestes**, mythological character

Aeschylus' trilogy about, 13-33, 34

Agamemnon avenged by, 14-452

and Electra, 14-452

in Greek tragedy, 13-37

**"Orestes,"** by Euripides, 13-38

**"Orfeo,"** opera by Gluck, 12-237

**"Orfeo,"** opera by Monteverde, 12-223

**Organ**, musical instrument, 12-258-D

Bach master of, 12-230, 262

cabinet, 12-216

church, on which Schubert played, 12-285

earliest, 12-217

electric, 1-449

pitch variation, 1-449

portable, 12-223, 225

**Organ**, physiology, 2-280

**Organ-pipe coral**, 3-102

**Organic Act of Porto Rico**, 7-60

**Organic chemistry**, 10-548

**Organism**, development of, 2-279

**Organized Militia**, see National Guard

**Organized Reserves**, U. S. Army, 7-474

**"Orgaz, The Burial of Count,"** painting by El Greco, 11-244, 247

**Orient**, see Volume 5 *histories of all Asiatic countries*

**Orient**, trade with, 10-235-38, 242

**Oriental amethyst**, gem, 9-432

**Oriental aquamarine**, gem, 9-432

**Oriental architecture**, see subhead architecture under China; India; Japan

**Oriental art**, theory, 13-519; see also subhead art under China; India; Japan

**Oriental emerald**, gem, 9-432

**Oriental influence** in early Christian art, 11-78

**Oriental jewelry**, 12-120, 125

**Oriental rugs**, see Rugs, oriental

**Oriental topaz**, gem, 9-432

**"Origin of Species, On the,"** by Darwin, 13-436  
Lyell aids publishing, 13-431

**Orinoco crocodile**, 3-443

**Orinoco River**, South America, 5-494, 518-A

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Orinoco River**—*continued*

- basin, 5-518-E
  - area, 10-257
- delta, 5-518-E
- discovery, 13-452
- length, 10-253
- map, 5-602
- Orinoco Valley**, South America, llanos, 5-518-A
- Oriole**, bird, 4-†26-28
  - color plate, 4-\*89
  - nest building and breeding, 4-†26, 27-28
- Orion**, constellation
  - Galileo's discovery, 13-397
  - nebulae in, 1-182, 183
  - size, 1-170
  - star maps
    - Jan. and Feb., 1-178-B
    - March and April, 1-178-D
    - Nov. and Dec., 1-178-L
- Orion**, mythological character, 14-\*418
  - and Diana, 14-432
- "**Orion**," by Charles G. D. Roberts, 13-577
- Orion's belt**, in constellation, star map, 1-178-K
- Orissa**, India, to be separate province, 5-387-A
- Orizaba (Citlaltepetl)**, volcanic peak, Mexico, 7-87-B
  - map, 7-59, 1-5
- Orkhan**, sultan of the Turks, 5-411
- Orkney Islands**, No. Atlantic Ocean, description, 6-†486-87
  - added to Scottish domains, 6-118
  - arts, 6-487
  - conquered by Norway, 6-380
  - map, 6-574
- Orlando**, *see* Roland, legendary hero
- Orlando, Vittorio Emanuele**, portrait, 12-\*550
- "**Orlando Furioso**," by Ariosto, 13-65, 66
- Orléans, Charles, Duc d'**, friend of Villon, 13-105
- Orléans, Maid of**, 12-385; *see also* Joan of Arc
- Orléans, Philippe**, Duke of, regent for Louis XV, 6-185
- Orléans**, France, siege of, Joan of Arc's victory, 12-†389, 390
- Orleans, Territory of**, 8-142
- Orloff**, famous diamond, 9-430
- Ormond**, Earl of, head of Irish clan, 6-151
- Ornament**, *see* Decoration and ornament
- "**Oro y Plata**," motto of Montana, 8-220-A
- Orono**, Maine, university, 8-\*149
- Orphanages**, 7-441; *see also* subhead charities
  - and correction under each state for list of state orphanages
- Orpheus**, mythological character
  - and Eurydice, 14-432
  - joins Argonauts, 14-449
  - operas based on story of, 12-223, 237
  - women of Thrace and, 14-\*431
- "**Orpheus**," by Liszt, 12-298
- "**Orpheus and Eurydice**," opera by Gluck, 12-271
- Orpington**, breed of chicken, 9-\*350

- Orrefors crystal**, 12-†38
- Orrery, Charles Boyle**, Earl of, planetarium, 1-190
- Othodiagraph**, X-ray picture traced by, 2-354
- Orthodox Eastern church**, *see* Greek Orthodox church
- Oryx family**, antelopes, 4-\*417, \*419
- Osage Indians**, in Oklahoma, 8-317, 318, 320
- Osage orange**, tree, 2-\*272
- Osage River**, U. S.
  - Bagnell Dam, 8-212-A
  - Missouri, 8-212-A
- Osawatomie Brown** (John Brown), 12-534
- Osborne, Henry**, heads first Newfoundland government, 7-32
- Oscar I**, king of Sweden and Norway, 6-390, 407
- Oscar II**, king of Sweden and Norway, 6-390, 407
- Oscarshall**, castle of, Oslo, Norway, 6-\*386
- Osceola**, Indian chief, 5-71
- Oscillator**, radio, 10-†121-1-21-K
- Osgood, Samuel, Dr.**, bird sanctuary, 4-517
- Oshkosh, Wis.**, manufacturing, 8-444
- Osiris**, Egyptian god, 5-†54, 64
- Oslo, Norway**, 6-386, 407-A
  - military academy founded, 6-388
  - National Norwegian Theater, 13-99
  - rainfall and temperature, 6-407-A
  - slave church, 11-\*462
- Oslo Powers**, 6-416
- Osman I**, founder of the Ottoman empire, 5-411
- Osmec culture**, in early Mexico, 5-21
- Osmium**, element, 9-418
  - has highest specific gravity, 1-474
  - symbol, atomic no. and wt., 1-\*551
- Osmosis**, physics, 1-361
- Osmunda cinnamomina* (cinnamon fern), 2-\*91
- Osorno, Mount**, Chile, 5-\*494
- Osprey**, bird, 4-156
  - color plate, 4-\*152
  - nest building and breeding, 4-157
  - plumes, 4-†140, †146
- Ossian**, semi-historic Gaelic bard, 6-145
- Ostend, Belgium**, 6-350
- Ostend-Manifesto**, 12-456-E
  - Buchanan helps draw up, 12-456-B
- Ostia**, ancient port of Rome, 10-253
  - archaeology, 5-19
  - map, 6-588, 104
- Ostracism**, in Greece, 5-160, 161; 7-\*347
- Ostracoda**, crustacean, first appearance of, 3-64
- Ostracoderms**, animals, in Ordovician period, 3-15
- Ostrich**, largest living bird, 4-†232-36
  - Africa, 5-448, 453; 4-\*11
  - communal nests, 4-234
  - eggs, 4-232, \*237
  - leather, 9-\*69
  - ostrich farms, 4-235, \*233
  - plumes, 4-235
  - roams with zebras and antelopes, 4-233, 352
- Ostrogoths**, people, Rome seized by, 13-58
- Oswego, N. Y.**, 8-279
- Oswio**, king of Northumbria, 6-11

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Otago settlement**, Dunedin, New Zealand, 5-537  
**"Otello,"** opera by Verdi, 12-253, 300  
 bass viol used in, 12-258  
**"Othello,"** by Shakespeare, 13-158  
 scene from, 13-\*223  
**Othman**, caliph. of Arabia, 5-398  
**Otis, James**, speaking for colonists, 7-\*363  
**Oto Indians**, 7-†103  
 Oklahoma land grant, 8-317  
**Otranto**, Strait of, Europe, map, 6-565  
**Ottakar**, king of Bohemia, rules Austria, 6-259  
**Ottawa**, Canada, Parliament House, 7-\*23  
**Ottawa River**, Canada  
 length, 10-253  
 map, 7-593  
**Otten, Mitzi**, enamel work, 12-\*68  
**Otter**, animal, 3-222, \*224; 4-†361-62  
**Otto I**, the Great, reign, 5-295; 6-208  
 defeats Magyars at Lechfield, 6-278  
 head of Holy Roman Empire, 5-295  
 marriage and claim to Italy, 6-295  
**Otto IV**, Holy Roman emperor  
 defeated by Frederick II, 5-299  
 excommunicated and dethroned, 5-294  
**Ottoman empire**, *see* Turkey  
**Outamba (Mexico)**, **Battle of**, 7-76  
 Cortes at, 13-\*467  
**Ouachita Mountains**, United States, 7-343-C  
 8-27  
**Ouachita River**, *see* Washita  
**Oudenarde**, Belgium, British victory, 6-75  
**Oudney, Walter Bornu**, Sahara explored by, 5-453  
**Ounce**, unit of measure, 10-375  
**Ounce** (snow leopard), 4-\*291, 292, 5-368  
**"Our Delaware,"** state song of Delaware, 8-66-A  
**"Our Idaho,"** song, 8-92-B  
**Our Lady**, *see also* Mary, Virgin  
**Our Lady of Guadalupe**, miracle of, 7-81  
**Our Lady of the Snows**, name for Canada, 7-\*1  
**"Our Liberties We Prize and Our Rights We Will Maintain,"** motto of Iowa, 8-124-A  
**"Our Mutual Friend,"** novel by Dickens, 13-245  
**Ouspensky Cathedral**, Moscow, 12-\*449-D  
**"Out of the Cradle Endlessly Rocking,"** by Walt Whitman, 13-326  
**"Out of the Dark,"** by Helen Keller, 12-568  
**"Outcasts of Poker Flat, The,"** by Bret Harte, 13-334  
**Outer Mongolia**, division, China, 5-437  
 Tannu Tuva, republic, 5-438  
**Outerbridge, Miss.**, tennis introduced into U. S. by, 14-467  
**Outfielder**, in baseball, 14-504, 505  
**Outlanders**, South Africa, 5-486  
**Outriggers**, gunwale attachments, 14-532  
**Oval window of eardrum**, anatomy, 2-303  
**Ovary**, botany, 2-†102-3, \*172  
 apple blossom, 2-115  
 becomes a fruit, 2-104, 121  
 sweet-potato flower, 2-\*172  
**Ovenbird**, 4-59  
 graph of song, 4-\*5  
**Ovens**  
 bread making, 9-243  
 of Indians, 9-239  
 outdoor  
 Mesopotamia, 9-\*240  
 Quebec, 9-\*238; 7-\*14  
 thermometers used in, 1-391  
 travelling, 9-243  
**"Over the Tea Cups,"** by Oliver Wendell Holmes, 13-309  
**"Over the top,"** meaning, 10-364  
**Overcast stitch**, sewing, 14-†72  
**Overglaze**, pottery, 12-46  
**Overhang**, architecture, 11-\*497, 498  
**Overhead**, economics, 7-533  
**Overland stage**, 10-†190  
**Overland Trail**, 8-393  
**Overproduction**, agricultural, chemical industry  
 helps absorb, 10-546  
**Overshot wheel**, 1-\*505  
**Overside ports**, 10-246  
**Overture**, of opera, 12-225  
**Ovid, life and poems**, main article, 13-†51-52  
 portrait bust, 13-\*51  
**Oviedo**, Spain, carvings, 11-88  
**Ovules**, botany, 2-102-3  
 become seeds, 2-104  
 fertilization, 2-107, 125  
 of evergreens, 2-95  
 sweet potato flower, 2-\*172  
**Owen, Robert**, English Socialist, 7-438, 553  
**Owen ap Gwynedd**, leads revolt in Wales, 6-139  
**Owens Lake**, Calif., 8-42  
**Owens River**, Calif., 8-42  
**Owens Valley**, Calif., 8-42  
**Owl**, bird, description; kinds, 4-†164-68, \*163  
 ability to see in the dark, 1-423, 437  
 England, 4-175  
 great horned owl, 4-167  
 color plate, 4-\*152  
 nest building and breeding, 4-166  
 Oligocene period, 3-53  
 screech owl, 4-\*10, \*163, 165  
 symbol of wisdom, 13-\*1  
*see also varieties, as* Hoot owl; Screech owl  
**Owl butterfly**, 3-\*279, 283  
**Owl monkey**, 4-265  
**Owl parrot**, 4-192  
**Owl River**, *see* Moreau River  
**Ownership**, profits of, 7-537  
**Owyhee River**, U. S., 8-331  
**Ox carts**, 10-\*143, \*144; 9-\*190  
**Oxen**, cattle, 9-331, 333  
 as beasts of burden, 7-\*46  
 drawing of, 11-\*3  
 in lumber camps, 9-\*247, 251  
 Nigerian ox, 10-\*133  
 prehistoric, 3-57  
 used in farming, 9-\*101  
 wild, 4-†390-96

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Oxenstiern, Axel**, regent of Sweden, 6-401  
**Oxford, Robert Harley**, Earl of, 13-184  
**Oxford University**, England  
 boat races, 14-\*531, 533  
 founded, 6-21  
 library established, 10-556  
 Rhodes Scholarships, founded by Cecil Rhodes, 5-487  
 workmen's college, 13-238  
**Oxidation**, 2-334  
 and combustion the cause of fire, 10-334  
 discoveries about, 2-334; 13-380, 381  
 of food by cells, 2-344, 360, 366  
**Oxy-haemoglobin in blood**, 2-338  
**Oxygen**, element, 1-374  
 absorbed and given off by plants, 2-43, 49  
 aid to aviators, 10-368-B  
 air contains, 1-219, 373, 2-45  
 blood contains, 2-333, 338, 344  
   color plate, 2-374  
 burning due to, 1-373; 10-334  
 chemical behavior, 1-547  
 combustion and, 1-385  
 component of silica, 1-537  
 component of water, 1-357, †363-64, 13-378  
 dependence of nerves upon, 2-397  
 discovered and separated by Priestley, 2-49;  
   13-379  
 formation of molecule from atoms, 1-\*543  
 lack of, in closed rooms, 10-385  
 Lavoisier's discoveries, 13-380, 381  
 liquid, 10-418  
 pure, uses of, 1-374  
 rarity at high altitudes, 1-456  
 standard for atomic weights, 1-554  
 supplying aquarium fishes with, 3-218

**Oxygen** *continued*  
 symbol, atomic no. and wt., 1-\*551  
 tent for administering, to pneumonia patients,  
   2-\*389  
 united with carbon, 1-556  
 united with iron, 1-96  
**Oxygen-acetylene flame**, temperature, 1-\*392  
**Oxyhydrogen torch**, of diver, 10-522  
**Oyster**, 3-†157-60  
   anatomy, 3-\*159  
   Delaware fisheries, 8-66  
   destruction by starfish, 3-132  
   destruction by whelks, 3-147  
   eggs and hatching, 3-158  
   fresh water, 3-262  
   industry, 9-\*369, 370  
   Mississippi's industry, 8-205  
   pearls from, 3-†162-64  
   prehistoric, 3-9  
**Oyster boat**, 8-\*161  
**Oyster parks**, protection of oysters in, 3-160  
**Oyster shells**, in mountains, 1-\*20, 21  
**Oyster State**, nickname for Maryland, 8-162-B  
**"Oysters,"** people of Maryland, nickname, 8-162-B  
**Ozark Mountains**, highlands, U. S., 7-343-C  
   fruit growing, 9-162  
   Kansas, 8-131  
   map, 7-595  
   Missouri, 8-207, 212-A  
   Oklahoma, 8-320-A  
**Ozark State**, 8-212-B  
**Ozarks, Lake of**, 8-209  
**Ozone**, gas, 1-219  
   in air, 1-377

P

**P.M.**, abbreviation, 10-472  
**Pa**, name for Maori village, 5-532  
**Pablo Bird Refuge**, 8-220-A  
**Pace**, measure, 10-373  
**Pacheco, Francisco**, teacher of Velasquez, 11-248  
**Pacific, War of the**, 5-510  
**Pacific coastal plain**, South America, 5-518-A  
**Pacific Islands**, main article, 5-†520-29  
   archaeology, 5-521  
   how formed, 5-526  
   outside ownership and control, 5-522 fol  
   possessions of the U. S., 8-†463-467; 7-297, 300  
   races, 5-520, 521, 523, 528  
   religions, 5-523, 529  
**Pacific Ocean**  
   Balboa's discovery, 13-459  
   coral atolls, 5-521, 526, 529; 1-57  
   depth, 1-66  
   discovery, 13-459  
   explorations along American coast, 7-19

**Pacific Ocean—continued**  
   Japan Current, 1-\*223  
   Lewis and Clark's expedition to, 7-†207, \*209  
   map, 5-572  
   named by Magellan, 7-117  
   North Pacific trade route, 10-241  
   sailing vessels, modern, 10-242  
   size, 3-\*61, 5-520  
   volcanoes, 1-76  
**"Pacific problem,"** cause of, 5-522  
**Pacific time**, 10-473  
**Pacific wheat belt**, 8-90  
**Pacifism**, in U. S. during World War I, 7-322  
**Pacinian corpuscle**, 2-\*290  
**"Pack saddle,"** improvised, for injured person,  
   2-\*400, 401  
**Packet ships**, 10-173  
**Packing house industry**, *see* Meat industry  
**Packing houses**, U. S., 9-329  
   origin of name, 9-326

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Packs**, animals that hunt in  
 dhole, 4-306  
 weasels, 4-356  
 wolves, 4-290, 300, 301; 9-319
- Pacta conventa**, Polish charter, 6-447
- Paddle**, canoe oar, 14-511
- Paddle wheel boats**, 10-†218, \*219, †222, 223
- Paddlefish**, spoon-billed, 3-\*250
- Paddy field**, 9-†109
- Paderewski, Ignace Jan**, portrait, 12-\*256  
 heads Polish government, 6-454
- Padilla, Juan de**, revolt against Charles V, 6-  
 \*328, 329
- Padilla, Maria de**, 6-\*329
- Padua**, Italy  
 art, 11-138  
 Arena chapel; painting, 11-\*113
- Paducah, Ky.**, industries, 8-138
- Paganini, Nicolo**, 12-298, 258  
 and Berlioz, 12-306  
 guitar played by, 12-258-D
- Paganism**, 5-273
- Pages** (boys), medieval, 5-306
- Pagodas**  
 Chinese, 11-394, †400-1; 5-\*313; 12-\*100  
 Indian (East), 11-\*453  
 Japanese, 11-394, †400-1; 5-\*359
- Pagopago**, harbor of Tutuila, Samoa, 8-466
- Pahang**, state, Malaya, 5-430-B
- Pahang River**, a river of the Malay Peninsula  
 flowing into the China Sea, 5-430-A  
 map, 5-589
- Pain**  
 effect on skin, 2-381  
 relieved by medicinal plants, 9-217, 218  
 sense of, in skin, 2-291
- Paint**  
 lead in, 9-418  
 mixing of pigments, color plate, 1-\*434  
 oils in, 9-312; 10-546  
 quick drying, 10-553  
 turpentine and rosin in, 10-547
- Painted beauty**, butterfly, 3-276
- Painted Desert**, Ariz., 8-23
- Painted eel** (moray), 3-\*99
- Painted lady** (thistle), butterfly, 3-†277 fol.  
 color plate, 3-\*278  
 wing, 10-\*489
- Painted terrapin**, 3-474, \*475
- Painter** (cougar), 4-292, †293-94
- Painting**  
 artists learn to give roundness and solidity to,  
 11-113, 118  
 books of pictures, 11-\*104, 192, 193  
 by monks, 5-†279; 11-136  
 color plates, 11-frontispiece, 4 pages fol. \*360  
 color of Venetian painters, 11-172  
 compared to photography, 11-330  
 control of light and shade, 11-151  
 enamel, 12-68  
 glass windows, 12-72, 74, 76
- Painting** *continued*  
 Leonardo da Vinci's instructions to painters,  
 11-151  
 mixing pigments, color plate, 1-434; *see also*—  
*Colors, subhead art*  
 "modern," started by Masaccio, 11-132  
 oil glazes, discovery and early use, 11-125, 198  
 oils, 9-312  
 ordinary people first put into pictures, 11-  
 136, 196  
 perspective, 11-132, 137, 193  
 pointillism, 11-350  
 portraiture, *see* Portrait painting  
 rhythm of line, 11-145  
 spotlight effect of Tenebrists, 11-247, 249  
 still life, 11-284  
 story-telling in art, 11-320  
 styles  
   **American**, 11-†353-72, color plate, \*361  
   Assyrian, 11-28  
   Babylonian tiles and glazes replace, 11-28  
   **Baroque**, 11-†180-88, 218, 243, 273  
   British,  
     **landscape artists; Pre-Raphaelites**, 11-  
     †311-20  
     **portrait painters**, 11-†293-304  
       Van Dyck's work in England, 11-225  
       fol.  
     two great styles, 11-294  
   Byzantine, 11-79, \*80  
   Chinese, 5-†325-26  
   Christian  
     Byzantine, 11-79, \*80  
     illuminated manuscripts, 11-†84  
     Roman, 11-76, \*77  
     symbolism, 11-74  
   Cretan, 11-\*31, 32, \*33  
     vase painting, 11-\*32, \*33  
   **Dutch**, 11-†260-77  
   Egyptian, 11-10 fol.  
     Ikhnaton's innovations, 11-17  
     masks, 11-\*20  
     sameness of style, 11-14  
     statues, 11-12  
     wall decorations, 11-\*6, 10, \*12; 12-26,  
     176; 10-\*373  
   English, *see subhead British above*  
   Flemish, 11-124-25, †190-203, †216-28  
     color plate, 11-\*360  
     studied by German painters, 11-206  
   French  
     color plates, 11-frontispiece, fol. \*360  
     **early**, 11-†230-39, †279-90  
     **modern; Impressionists, Independents,**  
       **pointillists**, 11-†337-50, †379-92  
     Romanticists, 11-†322-35  
   fresco, 11-114  
   **German**, 11-†205-14  
   Gothic, 11-\*102, †104-5  
   Greek, 11-†49, 53; 5-158; 12-53  
     copies at Pompeii, 11-\*70  
     Cretan, 11-\*31, 32

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Painting, Greek—continued**

- during Hellenistic Age, 11-†58
- of statues, 11-49
- portraits, 11-53, 58
- vase painting, 11-†35-36, \*49, 50

**Italian**

- Baroque**, 11-†181-88
- division into two main groups, 11-248
- Florentine and other artists, 11-122, 124, †132-47

- Giotto and contemporaries**, 11-107, 108, †109-20

- influence upon Flemish artists, 11-202
- Leonardo da Vinci, 11-†149-54
- Michelangelo, 11-\*156, \*157, †153, 162
- Raphael**, 11-158, †164-69
- Venetian artists**, 11-†171-88

**landscape**

- American, 11-356, 361
- British, 11-298, 300, †311 fol.
- Gainshorough called the father of, 11-304
- Dutch school, 11-268
- Flemish school; Rubens, 11-222, 223, 224
- French school, 11-236, 237
- German school, 11-333
- Corot's work, 11-†327 fol.
- Greek, beginnings of, 11-58
- Italian, 11-\*185
- Roman, 11-71

**medieval**

- Gothic, 11-†102, \*104
- illuminated manuscripts, 11-†84, 88

**modernist**

- cubism, 11-\*388, 391
- impressionism, 11-†344-49
- internationalism, 11-392
- pointillism, 11-350
- post impressionism, 11-380

**mural**

- Egyptian, 12-26; 11-\*6, 10
- Italian, 11-110, 114
- modern, 11-342
- Roman, 11-\*57, \*70, 71
- prehistoric, 5-27, 30; 11-†1-4
- Roman, 11-\*57, †69-71
- Spanish**, 11-†241-58
- Goya, 11-†306-9
- Velasquez, 11-†247-57

**tempera and fresco**, 11-114**X-ray uncovers early portrait**, 10-\*493**Paiute Indians**, *see* Piute**Pakistan**, country, Asia, 5-387, 387-A**flag**, color plate, 14—following 570, no. 50**Jinnah's services to**, 6-566-67**Pala d' Oro**, altarpiece, 11-\*79, \*477; 12-66**Palace of Peace**, The Hague, 6-355**Palace of the Caesars**, Rome, ruins, 11-\*436**Palaces**: Buckingham Palace, 6-\*93**Chaldean**; Nebuchadnezzar's, 5-96**Escorial**, of Spanish kings, 6-\*332**Palaces—continued****French**

- Fontainebleau, 11-486, 488
- furnishings, 12-190
- Renaissance, 11-484, †486, \*487, \*488
- furniture, 12-186
- Roman, 12-179
- Spanish alcazar, 6-\*317
- Tower of London, 6-\*41
- Versailles, France, 11-\*233, 239, \*489, 490, 491; 12-411

*see also* Castles**Palaeologus John**, emperor of the East, portrait, 11-\*135, 138**Palaeologus, Michael**, emperor of the East, 5-410**Palais de la Nation**, Brussels, 6-\*349**Palamon**, character in "Canterbury Tales," 14-†335-36**Palanquin**, chair, 7-\*151**"Palanquin, The,"** painting, 7-\*151**Palatine Hill**, Rome, palace, 5-\*221**Palawan**, island, Philippines**area**, 5-570; map, 5-595**Palau**, Pacific island, 5-521**Palazzo Rezzonico**, Venice, 11-\*487**Palazzo Vecchio**, Florence, 11-\*483**Paleness**, cause of, 2-381**Paleolithic period**, 5-27**Paleontology**, *see* Fossils; Geology**Paleozoic era**, (Ancient Life) 3-6, 9 (*see also* entries under the main subjects below)**Cambrian period**, 3-9-10**Carboniferous period**, 3-†26-30**Devonian period**, 3-†21-24**forms of life in**, table, 3-64**Ordovician period**, 3-†12-15**outline of periods**, 1-40**Permian period**, 3-†32-35**Silurian period**, 3-†17-19**strata and fossils**, color plate, 3—frontispiece**Palestine**, country, Asia**Arabs and Jews in**, 5-138, 141; 6-559, 563-64**conquered by Alexander the Great**, 5-127**continual fight over**, 5-58; 6-\*559**crusades**, *see* Crusades**Dead Sea**, 1-44, 92**divided for the twelve tribes**, 5-120**headdress**, 9-\*88**Jews**, 5-†118-29**locust plagues**, 3-368, †369**maps**, 5-\*118, 582**modern life**, 5-\*139-41**Mohammedanism**, 5-280**part of Fertile Crescent**, 5-\*118**Roman conquest**, 5-129**topography**, 5-118**won for Christians**, 5-299**Palestrina, Giovanni Pierluigi da**, life; music, main article, 12-†250-60, 220**Palimpsests**, parchments scraped and rewritten, 5-271**Palisade cells** of leaf, 2-†26, \*42

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Palisades**, New Jersey, 8-268  
 composed of trap rock, 8-283
- Palisades Interstate Park**, 8-284-A  
 area in New Jersey, 8-252-A
- Palissy, Bernard**, 12-\*55, 58  
 pottery by, 12-\*54
- Palla**, article of Roman dress, 9-\*7
- Palladian architecture**, 11-493
- Palladio, Andrea**, 11-491, 502
- Palladium**, element, symbol, atomic no. and wt., 1-\*551
- Palladius**, missionary to Ireland, 6-145
- Pallas Athene**, goddess, *see* Athena
- Pallidus*, defined, 2-184
- Palliser, Hugh**, and Captain Cook, 13-488, 489
- Pallium**, Roman costume, 9-\*7
- Pallor**, attendant on Mars, 1-149
- Palm Royal**, 7-50
- Palm Beach**, Fla., 8-74
- Palm oil**, 9-190
- Palm squirrel**, 4-367
- Palm Sunday**, 14-581
- Palma**, a Canary Island, 6-491
- Palmate leaves**, 2-24, 25
- Palmer, Erastus W.**, statue by, 11-\*375
- Palmerston, Henry John Temple**, viscount, and Crimean War, 6-99
- Palmetto State**, nickname for South Carolina, 8-356-A
- Palms, trees, beauty; food and products from**,  
 main article, 9-†188-91; 2-\*6, \*193  
 carnauba, 2-258  
 disappearance in Miocene period, 3-53  
 leaves, 2-252  
 monocotyledonous plants, 2-†149  
 products from, 9-190, 191  
 vegetable ivory, 2-255  
 rattan stems, 2-253  
*see also* Coconut palms; Date palms
- Palmyra**, ancient city, Syria, 5-396
- Palmyra palm**, 9-191
- Palo Alto**, Calif., Leland Stanford University, located at, 8-41
- Palomar, Mount**, Calif., telescope, 1-\*189; 8-42-A; 1-123
- "Pamela,"** by Richardson, 13-187
- Pamir**, mountains of central Asia, 1-29  
 map, 5-586
- Pampas**, South American grasslands, 5-518-B
- Pampeluna**, siege of, Loyola's part in, 13-546
- Pamunkey Indians**, 8-412
- Pamunkey River**, Va., 8-418
- Pan**, god, 14-437  
 and Syrinx, 12-206  
 triumph over Apollo, 14-\*459, 460; 2-†302; 5-158
- Pan-American Exposition**, 10-\*393
- Pan-American Highway**, 7-343-B
- Pan-American Union**, 5-518
- Pan American World Airways**, 10-325
- P'an Ku**, Chinese legendary hero, 5-313
- Panama**, capital of Panama, ruins in, 7-\*47
- Panama**, country, Cent. America, description, 7-48; general data, 7-48-B  
 area, 7-48-B  
 becomes independent republic, 7-48, 306  
 birds, 4-58, 107  
 Canal Zone, 7-48  
 climate, 7-48-B  
 flag, color plate, 14-following 570, no. 51  
 government, 7-48-B  
 location, 7-48-B  
 maps, 7-599; 5-602  
 merchant marine, number, 10-232  
 Panama hats, 9-90  
 people, 7-48-B  
 physical features, 7-48 B  
 temperature and precipitation, 7-48-B
- Panama, Bay of**, Panama, map, 10-268-B
- Panama, Gulf of**, Panama, maps, 7-599; 5-602
- Panama, Isthmus of**, Cent. America, 7-48  
 breadth, 10-269  
 Drake defeats Spaniards, 12-404  
 maps, 7-591, 599
- Panama Canal**, Panama, 10-†269 fol.  
 building of, 10-270; 7-306  
 use of explosives, 10-\*417  
 effect on Canadian trade, 7-29-U, 29-V  
 Gatun Locks, 7-\*46, \*306  
 maps, 5-602; 7-591  
 profile and surrounding country, 10-268-B  
 showing size, 10-273
- Panama Canal Zone**, *see* Canal Zone
- Panama hats**, 9-90
- Panathenaic procession**, 11-423
- Panay**, island, Philippines  
 area, 5-570  
 map, 5-595
- Pancreas**, gland, 2-357, 361, \*362  
 color plate, 2-\*279  
 location in body, 2-352
- Pancreatic juice**, 2-357
- Panda**, animal, 4-†322
- Pandharpur**, India, city; holy men, 5-\*383
- Pandora** and her box, Greek myth, 14-†422-24
- Pandorus** sphinx moth, 3-290
- Panel-portraits**, ancient, 11-20
- Pangolin**, anteater, 4-\*454, 456
- Panhandle State**, nickname for West Virginia, 8-436 B
- Panhandleites**, nickname for West Virginians, 8-436-B
- Panhard and Lavassor**, gasoline cars made by, 10-278
- "Panic,"** poetic play by MacLeish, 13-355
- Panics**  
 Australia, 5-557  
 United States  
 1837, 7-228  
 1873, 7-282, 291  
 1907, "rich man's panic," 7-309  
 1929, 7-339  
*see also* Business cycle
- Panipat, Battle of**, 5-374

The asterisk (\*) refers to picture and its explanation only The obelisk (†) refers to illustrated text.

**Pannartz**, early German printer, 10-51  
**Panning gold**, 9-393  
**Panpipe**, musical instrument, 12-†204, 206  
**Pansy**, flower and plant, 2-49  
**Pantagruel**, character by Rabelais, 13-106  
**Panthéon**, Paris, painting from, 10-\*356  
**Pantheon, Rome**, 11-430, \*431  
     constructed by Hadrian, 5-241  
     Saint Geneviève enshrined in, 12-\*367  
**Panther (cougar)**, 4-292, †293-94  
**Panthers**, black (leopards), 4-292  
**Pantisocracy**, a Utopian community, 13-219  
**Panuco River**, Mexico, 7-87-B  
     map, 7-597  
**Panza, Sancho**, character by Cervantes, 13-\*75, 77  
**Panzer Division**, 10-368-F  
**Paoli, Pasquale di**, 13-\*194  
**Paolo di Dono**, *see* Uccello, Paolo  
**"Papa Goriot,"** by Honoré de Balzac, 13-128  
**Papacy**  
     aided by Franks, 6-168  
     ambitions of Alexander VI, 6-302  
     "Babylonian Captivity," 5-283, 298; 6-170  
     Charlemagne proclaimed emperor, 5-293  
     decline of temporal power, 5-299  
     definition of power under Mussolini, 6-315  
     division of land between Spain and Portugal, 5-496, 6-341  
     Erasmus and, 13-83  
     Gustavus of Sweden's quarrel with, 6-398  
     height reached under Innocent III, 6-298  
     lands governed by; Vatican City, 6-315, 466  
     luxury and riches of popes, 6-300  
     relations with medieval rulers  
         decline of papal power, 5-283, 298, 6-170  
         Florentine rulers resent interference, 13-60  
         Frederick II and Innocent III, 6-298  
         Gregory VII and ensuing conflicts, 5-286, †295-99; 6-295-96  
         Guelphs and Ghibellines, 5-297, 299  
         Henry IV humbled at Canossa, 6-\*295  
         investiture conflict, 6-†208  
         Leopold II of Austria, 6-258  
         papal power declared supreme, 5-276, 294  
         Poland's rulers and, 6-446  
         Portugal's kings, 6-338  
         Theodoric imprisons pope, 6-294  
     ring worn by popes, 12-125  
     titles of popes, 6-467  
**Papal Line of Demarcation**, dividing South America, 5-496  
**Papal State** (Vatican City), Italy, 6-315, †466  
**Papal States**, 6-301, 302, 303  
     and unification of Italy, 6-305, 306, 309  
**Papaya**, tropical fruit, 9-195, †196  
     juice of, aids digestion, 9-196  
**Papen, Franz von**, German vice-chancellor, 6-240  
**Paper**, main article, 9-†273-80  
     earliest made, 9-274; 10-\*43  
     early substitutes for, 9-273, †274, \*276  
     far-reaching effects of wood pulp invention, 7-577

**Paper--continued**

    how to make things of, 14-†10, †53  
     cut-outs from, 14-†9, †11, †12  
     imitation basketry made of, 12-134  
     industry, Canada, 9-\*280; U. S., 7-343-F  
     kinds of, 9-275  
     manufacturing processes, 9-†276-80  
     materials used for making, 9-119, †275, 277, 290, 293  
     mill, 8-\*240  
     wood pulp, made by wasps, 9-†273; 3-\*304, 306  
**Paper birch**, tree, 2-\*270  
**Paper money**, *see* Money  
**Paper mulch**, 9-\*186  
**Paper nautilus**, 3-\*145, 172  
**Papier-mâché**, racing shells made of, 14-532  
     straw used in, 2-180  
**Papillae**  
     hair, 2-†290  
     skin, 2-289, \*290, 291  
     tongue, 2-\*308  
**Papin, Denis**, 10-398  
**Papineau, Louis Joseph**, leader of French Canada, **biography**, 13-†570-72; 7-16; portrait, 13-571  
**Papoose**, Indian baby, 7-102, \*104  
**Paprika**, seasoning, 9-\*208  
**Papua**, island, Malay Archipelago, *see* New Guinea  
**Papua, Gulf of**, New Guinea, map, 5-597  
**Papua, Territory of**, island of New Guinea, 5-525  
**Papuans**, natives of New Guinea, 5-523, 525, 9-\*5  
**Papyrus**  
     Egyptian, 9-273, \*274; 10-\*34, 44  
     Greek books written on, 5-172  
     rope made from, 9-284  
**Pará**, Brazil, commerce, 10-241; 9-203  
**Para rubber**, 9-\*271  
**Parabola**  
     geometric figure, 1-162  
     motion in paths of, 1-287  
     of comet, 1-162  
**Parachute**, in action, 10-363, †320  
     resistance to air, 1-310, 474  
**Paracutin**, volcano in Mexico, 1-76  
**Parade of locomotives**, Baltimore, 10-183  
**Paradise**, bird of, 4-†183; 3-\*68  
**Paradise crane**, bird, 4-\*104  
**Paradise fish**, 3-233  
**"Paradise Lost,"** by John Milton, 13-†169  
     expression of Puritanism, 6-70  
**Paradise of the Pacific** (Hawaii), 8-456  
**Paradise Peak**, St. Martin, West Indies, 7-63  
**"Paradise Regained,"** by John Milton, 13-169  
**Paradox frog**, 3-419  
**Paraffin wax**, 9-450, 456  
**Paraguay**, country, So. Amer., description, 5-509; general data, 5-518-G; area, 5-518-G  
     climate, 5-518-G  
     flag, color plate, 14-following 570, no. 52  
     government, 5-518-G

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Paraguay—continued**

- history, 5-499, 507, 509, 510, 513
- location, 5-518-G
- map, 5-604
- people, 5-518-G
- physical features, 5-518-G

**Paraguay River**, South America, chief tributary of Parana; rises in S. W. Brazil, flows south through Paraguay, 5-518-G

- basin, 5-518-G
- length, 10-253
- map, 5-604

**Paraguayan War of 1865-1870**, 5-509**Parakeet**, bird, 4-192

- color plates, 4-\*184, \*185

**Parallax of star**, how to determine, 1-173**Parallel and series connections**, 1-†517**"Parallel Lives,"** by Plutarch, 13-43**Paraná River**, South America, rises in Brazil; flows to Plata estuary, 5-518-G

- basin, 5-518-G
- length, 10-253
- map, 5-605
- tributaries, 5-518-A

**Parasites**, definition, 2-55; 9-100**animal**

- leech, 3-\*396, \*399
- living in sponges, 3-84
- parasitic anemone, 3-93
- use of shells by crabs, 3-181

**plant**, 2-†55-58, 74

- bacteria, 2-12 fol.
- fungi, 2-55, 56, 58, 74
- plant diseases caused by, 2-†136-41
- partial and total parasites, 2-56
- Rafflesia, 2-†250
- symbiosis, 2-58
- see also Bacteria, 2-58

**Parasol ant**, 3-326, \*320**Parasol of the sea goddess Otohime**, 3-\*105**Paratrooper**, in action, 10-\*363**Paratroopers**, Soviet, 6-\*524**Parcel Post service**, 10-92**Parchment**, source and uses, 9-†274**Parchment rolls**, books on, 10-45**Parchment worm**, 3-\*123, \*125**Paré, Ambroise**, performing operation, 13-\*364**Parenchyma**, of stem, 2-29**Parents**, devotion of Japanese to, 5-349**Paria, Gulf of**, 7-54-B**Pariah**, an outcast of India, 5-369**Pariah dogs**, 4-503**Paris**, France, 10-254-55; 6-\*202-A

- battle between Franks and Normans, 6-\*168
- becomes seat of Royal Court, 6-169
- besieged by Henry of Navarre, 6-179
- Bibliothèque Nationale, 10-560
- changes made to improve city plan, 7-446
- first waterworks, 10-537
- German troops entering, 6-\*509
- Gobelin tapestry works, 12-143
- heraldic device of frogs, 8-206-A

**Paris—continued**

- Library of the Sorbonne, 10-556
- Louis VI gives charter to, 6-\*171
- Louvre, palace, 11-236, 488
- Luxembourg, palace, 11-\*221, 224
- map, 6-578
- painting of, 11-\*104
- peace conference of 1919, 7-327-28; 12-552
- quays, 13-136
- rainfall and temperature, 6-202-B
- saved by Saint Geneviève, 12-†366 67
- Seine River, 10-254
- surrender to Germans, 1871, 6-229

**Paris, Treaties of**

- 1763 (Seven Years' War), England and France, 5-382; 7-143
- 1783 (American Revolution), 6-81, 7-53, 170
- disposition of Northwest Territory, 8-182
- 1898 (Spanish-American War), 7-297

**Paris**, Trojan prince, in story of "The Iliad," 13-28**"Paris and Helena,"** opera by Gluck, 12-272**Paris basin**, region in France, climate, 6-202-B**Paris green**, insect and fungus killer, 10-546**Parish**, in Louisiana, 8-146-A, 142**Parker, Alton B.**, 7-305**Parker, Frank**, 14-466**Parker, Sir Gilbert**, Canadian author, 7-29-H**Parkersburg, W. Va.**

- industries, 8-435
- temperature, 8-436-A

**Parking a car**, 2-445**Parks**

- Alaska, 8-16-A
- and playgrounds, municipal, 7-401
- Chicago's system the finest, 8-106-A
- national, 7-†404-9; see also National Parks
- see also subhead parks under each state

**Parliament building**, Australian, 5-\*558**Parliament, British**

- buildings, 6-\*78; 10-\*465; 11-\*346
- cabinet, 6-78
- Great Protestation, 6-60
- Gunpowder Plot, 6-\*59, \*60, 62
- history
  - development from council, 6-37; 7-353
  - called in 13th century, 6-25
  - growth of power, 6-25, 32
  - Edward II deposed, 6-25
  - Model Parliament, 6-25
  - separation into two houses, 6-25
  - powers in 15th century, 6-37-38
  - Henry VII and, 6-42, 43
  - Henry VIII calls, 6-45
  - regulates labor under Elizabeth, 6-53
  - Stuarts and, 6-60 fol.; 12-407-9
  - war between Roundheads and Cavaliers; Cromwell, 6-64 fol.
  - Hanoverians and, 6-75, 77
  - new relationship between king and parliament, 6-77-78
  - "rotten borough" representation, 6-93, 94

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Parliament, British**, history—*continued*

- Reform Bill of 1832, 6-94
- Constitution Act in behalf of New Zealand, 5-537
- power of Lords curtailed, 6-102
- women granted vote, 6-103
- hourglass used in House of Commons, 10-462
- Long Parliament, 6-63, \*69; 12-407-9
- orators, 13-201, 206, 234
- Petition of Right, 6-62
- power, extent of, 7-357
- Rump Parliament, 6-68
- Short Parliament, 6-63
- woolsack in House of Lords, 9-75
- Parliament, Canadian**, 7-33-G-I
- Parliament, Houses of**, London, 6-\*78
  - clock and tower, 10-\*465
  - painting by Monet, 11-\*346
- Parliament, Icelandic**, 6-†418, 419, 420
- Parliament, Irish**, until 1800, 6-149
- Parliament, Scottish**
  - given wide powers, 6-117
  - votes to go out of existence, 6-129
- Parliament House**, British Columbia, 7-\*24
- Parliament House**, Ottawa, Canada, 7-\*23
- Parliamentary Gothic**, architecture, 6-\*78, \*277
- Parma, Cathedral of**, dome paintings by Correggio, 11-\*181, 184
- Parmesan cheese**, 9-348
- "Parnassus,"** painting by Claude Lorrain, 11-\*236
- Parnassus, Mount**, 14-436
- Paros**, island of the Aegean Sea, marble, 6-368-B
- Parotid gland**, 2-\*335, \*355
- Parr, Catherine**, 12-393, 395
- Parr, young salmon**, 3-248
- Parris Island, S. C.**, Huguenot settlement, 8-349
- Parrot**, bird, 4-188, †190, †192
  - Oligocene period, 3-53
  - powder-down feathers, 4-13
- Parrot fish**, 3-205
- Parr's Ridge**, 8-162-A
- Parry, Richard**, and Welsh Bible, 6-140
- Parry, William**, 13-496
- Parry**, in fencing, 14-\*513, 514
- Parry Islands**, Arctic Ocean, maps, 13-502-A; 5-572
- Parsees**, group of people in India, 5-106, fire worship, 10-334
- Parsifal**, knight, in German poetry, 6-211
- "Parsifal,"** opera by Wagner, 12-250, 296
- Parsley family**
  - condiments derived from, 9-311
  - flower structure; seeds, 2-168
- Parsnip**, vegetable, 9-150
  - water content, 2-259
- Parson Capen House**, Topsfield, Mass., kitchen, 12-\*196
- Parsons, Sir Charles Algernon**, 10-401
- Parthenon, Athens**, 11-\*419, \*420, †421-23
  - beauty, 5-\*169, 172
  - diagram of capitals and entablature, 11-\*419

**Parthenon, Athens**—*continued*

- history, 5-17
- reproduction; Nashville, 11-\*415
- sculptures, 11-\*43, †44-46; 14-\*406
  - Elgin Marbles, 11-\*422, 423; 5-\*16, 18
  - statue of Athena, 5-\*170; 11-45, 46, 423; 12-84, 101
- Parthians**, people
  - flag, 14-facing \*572
  - war with Romans, 5-240, 242
- Parties**
  - games, 14-†149-74
  - homemade favors, 14-†7-14
  - puzzles, tricks, etc., 14-†89-142
- Parties, political**
  - Canada, 7-25, 26, 29
  - England, 6-95
    - Labor party, 6-101, 108
    - Whigs and Tories, 6-93
  - general terms replace party labels, 7-335
  - "left" and "right," meaning of term, 7-335
  - United States, 7-366, 370-72
    - alignment between Democrats and Whigs, 7-228
    - dominance of Republican party from 1861-1913, 7-285
    - farmer-labor elements become Democratic party, 7-222
    - Jacksonians; War Hawks, 7-222
    - party lines wiped out, 7-216
    - Populist party of the 1890's, 7-291, 292
    - Prohibition party, 7-335
    - spoils system, 7-224
    - struggles between, during early years of Republic, 7-195-200, 203, 207
    - see also Communism; Fascism; Nazis, and also names of parties, as Conservative party; Labor party; Liberal party, etc.
- Partito Popolare Italiano**, political party, 6-310
- Partnership**, economics, 7-523
- Partridge** (bobwhite), game bird, 4-78, 94
- Parus carolinensis*, bird, 8-296-A
- Pasadena, Calif.**
  - California Institute of Technology, 8-41
  - Mount Wilson Observatory, 1-\*188, \*189
  - New Year's Day floral parade, 14-578, \*579
  - Tournament of Roses, 8-43
- Pascagoula, Miss.**, early settlement, 8-201
- Pascagoula River**, U. S., length, 8-206
- Pascal, Blaise**, main article, 13-†108-9
  - adding machine, 10-426
  - contemporaries, 12-412
- Pascal's principle**, 1-368
- Paschal II**, pope, 6-†208
- "Pasque,"** meaning, 8-364-A
- Pasque flower, American**, 8-364-A
- Pass**, basketball term, 14-485
- Passage graves**, Scandinavian, 6-†373
- Passaic, N. J.**, woolen mills, 8-248
- Passaic River**, N. J., 8-252
  - Paterson silk industry dependent on, 8-247
  - water power, 8-252

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Passamaquoddy Indians**, 8-150, 152  
 reservation, Maine, 8-156-A
- Passe-partout frame**, how to make, 14-†52
- Passing the cards**, game, 14-160
- Passing the penny**, game, 14-154
- "Passion According to St. John,"** by Bach, use of lute in, 12-258-D
- "Passion According to St. Matthew,"** by Bach, 12-230  
 Mendelssohn directs performance, 12-288
- Passion flower**, 8-374
- "Passion Flowers,"** by Julia Ward Howe, 13-317
- Passion Play**, of Oberammergau, 12-327, †328
- Passive resistance**, in India, 5-387
- Passports**, issuance of, 7-374  
 rings used as, 12-118
- Paste diamonds**, 9-429
- Pastern**, of horse, 4-508
- Pasteur, Louis**, life and work, main article, 13-†367-69  
 honored by Sorbonne, 13-\*368  
 hydrophobia cured by, 13-368  
 portrait, 13-\*367  
 silkworm disease conquered by, 13-368  
 triumph of chemical knowledge, 10-549
- Pasteurization**, of milk, 9-335, \*337, 341; 13-367, 368, \*369
- Pastimes**, *see* Amusements
- Pastoral age**, 9-79
- Pastoral poetry**, 9-79; 13-150
- Pastoral Symphony**, by Beethoven, 12-241  
 bass viol used in, 12-258
- Pastorius**, leader of Mennonites, 8-335
- Patagonia**, southern part of Argentina, 5-518 II  
 birds  
 fossil birds, 3-56  
 godwits, 4-118  
 climate, 5-518-B
- Patagonian sea lion**, 4-332
- Patagonians**, giant race of people, 13-463
- Patapsco River**, Maryland, length, 8-162-A
- Patchwork quilt**, how to make, 14-†78
- Patent leather**, 9-72
- Patent Office**, U. S., 7-381
- Patents**, on inventions, 7-381
- Paterson, A. B.**, Australian poet, 5-560-E
- Paterson, William**, 12-\*496
- Paterson, N. J.**, industries, 8-247; 9-38
- Patesi**, priest-king of Sumer, 5-78
- "Pathétique" Symphony**, by Tschaiakovsky, 12-236
- "Pathfinder, The,"** by James Fenimore Cooper, 13-297
- Pathfinder Bird Refuge**, 8-454-A
- Pathfinding and stalking**, main article, 14-†561-68
- Patience Bay**, Japan, map, 5-592
- Patina** of bronze, 12-24
- Patna**, India, Chandragupta's capital, 5-370
- Patriarch**, name for Jewish leader, 5-134
- Patriarch of Ferney** (Voltaire), 13-118
- Patricians**, 7-348
- Patrick, Saint**, life of, 14-579, †580  
 conversion of Ireland, 14-†580; 6-9  
 red cross, 14-facing \*572, 573  
 services to Ireland, 6-145
- Patriotic days**, 14-†584-86, 587-88
- Patriots' Day**, 8-176-B
- Patroclus**, Greek hero in Trojan War, 13-28
- Patrol bombers**, 7-488
- Patron of poets**, meaning of term, 13-48
- Patrons, Roman**, 5-\*245
- Patroon system in New Netherlands**, 8-274
- "Patterns,"** poem by Amy Lowell, 13-349
- Patterns in art**  
 Byzantine use of, 11-79  
 Cubist art, 11-391  
 Duccio, 11-†117, 120  
 Greek drapery, 11-†39, †41-42, †44  
 how woven, 10-344  
 Mohammedan art, 11-242  
 stained glass, 12-73  
 work of French modernists, 11-350, 386
- Patterson, Daniel S., Dr.**, 13-557
- Patterson, William**, plans Bank of England, 6-77
- Patuxent Indians**, Maryland tribe, 8-159
- Patzcuaro Lake**, Mexico, 7-\*83
- Paul, Saint**  
 burial place, 11-\*75  
 influence of writings on Luther, 13-542  
 painting by Durer, 11-\*210, 211  
 preaching, 5-3, 5, 6; 11-\*73
- Paul III**, pope, portrait by Titian, 11-178
- Paul IV**, pope, 11-\*485  
 enforces rules, 12-260
- Paul I, Petrovich**, czar of Russia, 6-\*433, 434
- Paul F. Rainey Wild Life Sanctuary**, 4-517
- Paul Meyer roses**, 2-\*163
- "Paul Revere's Ride,"** by Longfellow, quoted, 13-†302
- Paulinus of York**, 6-9, 10
- Paulus Hook**, N. J., early Dutch settlement, now Jersey City, 8-250
- Pausanias**, "Description of Greece," 5-19
- Pavements**, Greek and Roman mosaics, 12-110, 115
- Pavia, Battle of**, 6-176
- Pavilion**, portion of cut gem, 9-\*430
- Pawcatuck River**, R. I. and Conn., 8-347
- Pawn**, chess piece, 14-487
- Pawnee Indians**, Oklahoma land grant, 8-317  
 Houston mediates with, 12-515
- Pawtucket, R. I.**, cotton mill, 8-\*345
- Pawtucket River**, Rhode Island, 8-347
- Pax Romana**, 5-207; 6-319
- Paxton, William M.**  
 "Tea Leaves," painting, 11-\*367
- Payer, Julius**, 13-500
- Payne, Dorothea**, *see* Madison, Dolly
- Payne-Aldrich Tariff Bill**, 7-310; 12-456-B
- Pea**, vegetable, 9-150  
 canning of, 9-229; vining, 9-\*153  
 fruit, 2-\*118

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Pea—continued**

- life history of plant, 2-\*128
- Mendel's studies of heredity in, 13-415
- soil benefited by, 10-546
- structure of flower, 2-†101-4
- tendrils, 2-154
- see also* Pea family

**Pea crab, 3-181, 182****Pea family**

- flower structure, 2-166
- plants in, and their value, 2-168
- proteins in seeds, 2-129
- seeds, 2-217
- symbiosis with bacteria enriches soil, 2-58, 168
- see also* Peas

**Peace and peace movement**

- Andrew Carnegie's aid to cause of, 12-565, 566
- civilization's dependence upon, 5-45; 10-368
- Denmark, 6-416
- disarmament and peace treaties after World War I, 7-338
- Gladstone's interest, 12-443
- Norway, 6-390
- peace conference, Hague, 1899, 7-301
- similar languages an aid, 10-7
- the "big four," 12-\*550
- Woodrow Wilson's efforts in behalf of, 12-552; 7-327-28
- see also* Disarmament; League of Nations

**"Peace and Plenty," painting by George Inness, 11-\*365, 368****Peace Conference at Versailles, 7-327-28; 12-552****Peace of, *see name of place, as* Paris, Peace of; Westphalia, Peace of****"Peace of God, The," sculpture by St. Gaudens, 11-\*352, 364****Peace Palace, Hague, 6-355; 12-\*565****Peace pipe, Indian, 7-106****Peace River, Canada, British Columbia and Alberta, 7-\*29-G**

length, 10-253

map, 7-592

**Peacedale, R. I., textile industry, 8-345****Peach blossom, state flower of Delaware, 8-66-A****Peaches, fruit, 9-\*166, 168**

Latin name, 8-66-A

section showing stone, 2-\*121

water content of leaves, 2-259

**Peacock, Thomas Love, and George Meredith, 13-262****Peacock, bird, 4-†188, †190-91; 9-359**

as symbol, 11-74, \*446

**Peacock butterfly, 3-276, 282****Peacock moth, 3-292****Peacock Throne, 5-105, 375; 9-432****Peacock worm, 3-118****Peak, mountain, in physiography, 1-25****Peale, Charles Willson, portrait of Washington, 7-\*178****Peanut butter, 9-198****Peanut hunt, game, 14-158****Peanut man, how to make, 14-†13****Peanut rolling, game, 14-160****Peanut-shelling race, game, 14-160****Peanuts, main article, 9-†198-99**

fruit, 2-\*118

proteins stored in seed, 2-129

where produced, 9-199; 5-471, 473

Virginia, 8-414

**Pear, fruit, 9-166; 2-\*118, 232****Pear, alligator, 9-194, \*195****Pearl divers, 3-\*162, †163, \*164****Pearl Lochs, The, Hawaii, map, 8-562****Pearl mussels, 3-262****Pearl of the Antilles (Cuba), 7-55****Pearl oyster, not a real oyster, 3-160****Pearl River, China, 10-265****Pearl River, U. S., 8-146****Pearl roach, fish, 3-\*230****Pearls, main article, 3-†162-64**

artificial, 3-164; 12-32

fresh-water, 3-163, †262

symbolic of purity, 12-150

where found, 3-160

**Pearson, G., quoted, 4-163****Peary, Marie Ahnighito, 1-166****Peary, Robert Edwin, search for North Pole, 13-†493, †500-1**

meteor found by, 1-165, \*166

portrait, 13-\*493

map of route to North Pole, 13-502-A

**"Peasant Dance," painting by Rubens, 11-\*222, 223****Peasants**

French paintings depict, 11-\*320-31, †334, 338

French Revolution, 6-191, 192

revolt in Hungary, 6-281

Russian; sold with land, 6-428

*see also* Costume, national; Serfdom

**Peasants' Revolt, England, 6-\*31, 32****Peasants' War, Germany, 6-213****Pease, Edward, 10-179, 188****Peat, how formed, 9-437, 438**

origin and use, 3-28; 2-85

**Peat bogs, formation, 3-27, 28****Pebble crabs, 3-180****Pebbles, how made, 1-49****Pecans, nuts, 9-201, 202****Peccaries, wild pigs, 4-\*434, 435; 9-72****Peck, unit of measure, 10-375****Pecka, Harry, song by, 8-228-A****Pecos River, U. S., 8-262**

dam, 8-\*256

Texas, 8-386

**Pectens (scallops), 3-156, †157****Pectoral sandpipers, birds, 4-\*117****Pedal Organ, 12-258-D****Pedestrians**

carelessness, 2-446

road danger at night, 2-\*442

safety precautions, 2-428

**Pediment of Greek temple, 11-†40****Pedro I (Dom Antonio Pedro de Alcantara Bourbon), emperor of Brazil, 5-508**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Pedro II** (Dom Pedro de Alcantara), emperor of Brazil, 5-508  
and Alexander Graham Bell, 10-112
- Pedro Cay**, West Indies, 7-54
- Pedro Miguel Lock**, Panama Canal, 10-\*269, 273
- Pedrolino**, character in Italian comedy, 12-329
- Peduncle**, of plant, 2-\*48, \*126
- Peedee River**, North Carolina and South Carolina, 8-356.
- Peel**, Sir Robert, 6-95
- "Peer Gynt,"** drama by Henrik Ibsen, 13-88
- "Peer Gynt"** Suite, by Edward Grieg, 12-304
- Peewees**, birds, 4-†63-64  
graph of wood peewee's song, 4-5
- Pegasus**, winged horse, 14-432; 10-313, \*314  
and Bellerophon, 14-444, †445
- Pegasus**, constellation, 1-178  
star maps  
Jan. and Feb., 1-178-A  
July and August, 1-178-G  
Nov. and Dec., 1-178-L  
Sept. and Oct., 1-178-J
- "Peggy Stewart,"** ship burned because of tea cargo, 8-160
- "Peggy Whitethroat"** (willow wren), 4-175
- Peiping** (formerly Peking), China  
climate, 5-336-A  
January temperature, 5-336-C  
"Forbidden City," 5-330, \*333  
gate, 11-\*401  
Manchus' capture of, 5-330  
map, 5-591, N5  
port, 10-264  
taken by South China: renamed, 5-335  
Temple of the Happy Year, 5-\*322
- Peisistratus**, *see* Pisistratus, tyrant of Athens
- Pekinese**, dog, 4-\*493
- Peking**, *see* Peiping, China
- "Pekitanoui,"** Indian word, 8-212-B
- Pelargonium** (geranium), in South Africa, 2-229
- Pelayo**, Christian leader in Spain, 6-335
- Pele**, goddess, and volcano Kilauea, 1-10
- Pelé**, Mont, volcano, Martinique, 7-†64
- "Pele's hair,"** from lava drops, 1-10
- Peleus**, legendary king of the Myrmidons, represented on Portland Vase, 12-†29
- Pelias and Jason**, mythological characters, 14-449
- Pelican**, bird, 4-\*11, \*185, \*193, 196; 3-\*178, \*438  
Oligocene period, 3-53  
refuge, 4-\*516
- Pelican Island**, Florida, bird sanctuary, 4-517
- Pelican State**, 8-146-A
- "Pelicans,"** nickname for people of Louisiana, 8-146-A
- Pellagra**, deficiency disease, 2-364
- "Pelléas and Mélisande"**  
drama by Maurice Maeterlinck, 13-100  
opera by Claude Debussy, 12-318
- Pellico**, Silvio, Italian poet, 6-306
- Pelly River**, Canada, 8-16
- Peloponnesian Wars**, 5-169, 173
- Peloponnesus**, ancient name for the Morea, Greece, 5-151; 6-368-B
- Pelton water wheel**, 1-370
- Pelusium**, Siege of, 5-\*104
- Pelvic bones**, color plate, 2-\*278
- Pelycosaurians**, prehistoric animals, 3-34
- Pemaquid Pond**, graves along banks, 8-149
- Pembina**, N. Dak., Lord Selkirk's settlement, 8-299
- Pembina Mountains**, North Dakota, 8-302
- Pembroke**, Richard Strongbow, earl of, *see* Clare, Richard de, earl of Pembroke
- Pemmican**, Indian name for dried meat, 9-326
- Pen**, writing, *see* Pens
- Penal colonies**, in Australia and Tasmania, 5-547 fol.
- Penang**, island, Malaya, 5-426, 430-B  
cloves grown in, 9-209  
map, 5-589
- Pencil**, lead, materials in, 1-1
- Pendants**, ancient Egyptian, 12-\*119
- "Pendennis,"** by Thackeray, 13-241
- Pendleton Act**, 7-287; 12-456-B
- Pendulum**  
automatic scales, 10-†372  
discovery and development of, 10-†463 67  
law of, discovered by Galileo, 1-292; 13-396  
periodic motion, 1-287, \*288
- Pendulum clock**, invention of, 1-292, 13-377
- Penelope**, wife of Odysseus, 14-453; 13-29
- "Penguin Island,"** by Anatole France, 13-137
- Penguins**, Antarctic birds, 4-†218-21, 210, \*216, \*217, 232; 13-\*504, \*505  
eggs and hatching, 4-†219, \*220, 221
- Penicillin**, drug, 9-219-A
- Peninsula State**, nickname for Florida, 8-76-A
- Peninsular bear**, 4-\*319
- Peninsular War**, 12-434-35  
activities in Spain before outbreak, 6-332  
Madrid uprising an outcome of, 6-\*333  
St. Sebastien defended, 6-\*87
- Penn**, Richard, 10-146
- Penn**, William, life and work, 12-†461-62  
relations with Indians, 12-\*461, 462  
treaty of friendship, 12-462; 7-\*133
- Penn House**, in Philadelphia, 12-462
- Pennacook Indians**  
Maine, 8-156-A  
modern in New Hampshire, 8-242-B  
New Hampshire, 8-238
- "Pennamites,"** nickname for Pennsylvanians, 8-342
- Pennant's parakeet**, bird, color plate, 4-\*184
- Pennell**, Joseph, 10-65
- Pennies**, *see* Coins
- Pennine Alps**, mts., Europe, map, 6-588
- Pennine Chain or Range**, series of hills in England, 6-108-B
- Penn's Forest**, meaning of Pennsylvania, 12-462
- Pennsylvania**, state, U. S., description and history, main article, 8-†333-40; general data, 8-341-342-A

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Pennsylvania, state, U. S.—continued**

agriculture, 8-340  
 chestnut tree blight, efforts to stop, 2-141  
 area, 8-341  
 charities and correction, 8-342  
 cities, towns, list, 8-342-A  
 chief industrial, 8-338, 339  
 climate, 8-341  
 counties, list, 8-342-A  
 education, 8-340  
 institutions for promotion of the arts, list, 8-341  
 institutions of higher learning, list, 8-341  
 flag, 8-342  
 turniture of Germans, 12-198  
 Glacial Age, 1-†61  
 history, 8-334-36  
 Franklin represents, in England, 12-466  
 signs Declaration of Independence, 7-173  
 William Penn, 12-461-62  
 holidays, 8-342  
 Indians, 8-334, 335, 339  
 French and Indian Wars, 8-336  
 reservation, 8-342  
 interesting facts, 8-342  
 location, 8-341  
 map, 8-541  
 on United States map, 7-595  
 monuments, 8-342; *see also* Gettysburg  
 motto, 8-342  
 name, 8-342  
 nicknames, 8-342  
 Pennsylvania Dutch, 8-335  
 parks, 8-342  
 physical features, 8-341, 340  
 political facts, 8-342  
 products and industries, 8-337  
 Quakers, 8-333, 334  
 reservations, wi l-life, 4-517  
 state bird, 8-342  
 state flower, 8-342  
 state song, 8-342  
 transportation, 8-337  
 "Pennsylvania," song, 8-342  
**Pennsylvania, University of**, 8-334, 340  
 Benjamin Franklin chief founder, 12-465  
 College Hall, 8-334  
 excavations in Irak, 5-75  
**Pennsylvania Art Museum**, 8-341  
**Pennsylvania Bridge**, Washington, D. C., 8-342  
**Pennsylvania Day**, 8-342  
**Pennsylvania Dutch**, 8-335; 12-555-F  
**"Pennsylvania Gazette, The,"** published by Franklin, 10-56, 77, 88  
**"Pennsylvania of the West,"** 8-212-B  
**Pennsylvania State College**, State College, Pa., first driving courses, 2-447  
**Pennsylvania Trading Company**, 8-116-A  
**Pennsylvania Turnpike**, 10-156  
**Pennsylvanian period**, 1-40  
**Pennyweight**, 10-374

**Penobscot Bay**

taken by British, 8-152  
 yachting, 8-155  
**Penobscot Indians**, 8-150  
**Penobscot River**, Maine, 8-156  
 ancient graves along banks, 8-149  
**Pens**, writing, 10-35  
 fountain, 1-463  
 quill, 9-358  
**Pensacola**, Fla., resort city, 8-75  
**"Penseroso, II,"** poem by John Milton, 13-167  
**Pentagon**, geometric figure, 10-439  
**Pentagon Building**, Washington, 7-373  
**Pentateuch**, 10-13  
**Peonage**, abolished in Guam, 8-465  
**Peons**, lower social class, in Mexico, 7-82  
**People**, miniature, how to make, 14-†7  
**"People of the Abyss, The,"** by Jack London, 13-341  
**People's Charter**, England, 6-95  
**People's Crusade**, 5-408  
**People's Front**, political party  
 France, 6-202  
 Spain, 6-202, 335  
**Peoples**, *see* Races; *Costume and also main articles of various countries*  
**Peoria**, Ill., fort, 8-96  
 industries, 8-104  
**Peoria, Lake**, Ill., 8-106  
**Pepi II**, king of Egypt, 5-56  
**Pepin the Short**, *see* Pippin  
**Pepin, Lake**, Wis., 8-446  
**Peplos**, Greek garment, 9-6, 8  
**Pepo**, fruit group, 2-121, 256  
**Pepper**, sweet, vegetable, 9-150  
**Pepper**, 9-208, 209; 2-124  
**Pepsin**, in gastric juice, 2-356  
**Pepys, Samuel**, life of, 13-†172, quoted, 9-18  
**Pequot Indians**, in Connecticut, 8-58  
**Perak**, state of Malaya, 5-430-B  
**Perbunan**, *see* Buna N  
**Percentage**, mathematics, 10-432  
**Perceptions**, defined, 13-8  
**Percheron**, horse, 4-511  
**Perches**, fishes, 3-235, 236, †237  
 jewfish, 3-73  
**Percival, Sir**, and Holy Grail, 14-394, 398  
**Percussion instruments**, 12-258-C  
**Percy, Henry**, earl of Northumberland, 6-35  
**Percy, Henry, Sir** (Hotspur), 6-35  
**Percy, Thomas**, earl of Worcester, 6-35  
**Perdido River**, U. S., 8-76  
**"Père Goriot,"** by Balzac, 13-128  
**"Peregrine Pickle,"** novel by Smollett, 13-191  
**Perfect gas**, 1-547  
**Perfume bottles**, glass, 12-28  
**Perfumes**, main article, 9-†290-302  
 almond oil used in, 9-312  
 ambergris a fixative for, 4-446  
 Bulgaria's industry, 6-362, 363; 9-300  
 civet a source, 4-296  
 coal tar a source, 9-445

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Perfumes—continued**

- Middle Ages; use, 5-304
- oil of cloves, 9-209
- synthetic, 9-300, 302
- testing of, 9-301

**Pergamon Museum**, Berlin, 11-38

**Pergamum** (Pergamon), ancient city, Asia Minor, culture, 13-358

- altar to Zeus, 11-56, \*416

- the word "parchment" derived from, 9-274

**Peri, Jacopo**, "Dafne," 12-223

**Periander**, tyrant of Corinth, 5-160

**Pericardium**, sac surrounding the heart, 2-370, 377

**Pericarp**, of corn seed, 2-\*126

**Pericles, Athenian statesman, biography**, main article, 12-†342-43

- Athenians turn against, 5-173

- character; achievements, 12-343

- friendship for Phidias, 11-46

- golden age of rule, 5-†168 73

- portrait bust, 5-\*168; 12-\*343

**Pericles, Age of**, Greece, main article, 5-†168-73

- art and learning, 5-168, 172

- education 5-171

- Sophists, 5-171

- see also* Pericles

**"Pericles, Age of," painting**, 12-\*342

**Pericycle**, of plant, 2-\*48

**Peridot**, mineral, 8-22

**Perilous ring**, game, 14-158

**Perim**, British island, Arabia, 5-336-D

**Periodic motion**, 1-287, \*288

**Perioeci**, free farmers of ancient Sparta, 5-154

**Peripatetic philosophy**, 13-9

**Periscope**, optical instrument, 10-\*306, 310

**Peristalsis**, action of digestive tract, 2-354

**Peristyle**, architecture, 11-418, 432

**Peritoneum**, lining of abdominal cavity, 2-362

**Periwinkle**, snail, shell of, 3-143

**Perkins, Frances**, first woman in United States cabinet, 7-337

**Perkun**, god, 6-448

**Perlis**, one of nine native states in the federation known as Malaya, 5-430-B

**Perm**, province, U.S.S.R., rock areas studied, 3-32

**Permanent Court of Arbitration**, The Hague, 12-\*565

**Permanent Court of International Justice**, dispute over Greenland laid before, 6-483

**Permanent Joint Board of Defense**, U. S. and Canada, 7-29-D

**Permian period; life in**, main article, 3-†32-35

- forms of life in, table, 3-64

- rock formation; table of periods, 1-†40

**Pernambuco**, Brazil, commerce, 10-241

**Peroneal nerve**, 2-\*396

**Perpendicular style**, architecture, 11-474

**Perpetual motion**, prevented by friction, 1-†315-21

- attempts to produce, 1-†315-18, 348

- Redheffer's machine a hoax, 1-\*315, 316

**Perpetual motion—continued**

- solar system, 1-319

- why impossible, 1-348

**Perrot, Sir John**, viceroy of Ireland, administration, 6-153

**Perry, Matthew Calbraith**, opens door to Japan, 5-360

**Perry, Oliver Hazard**, life, main article, 12-†499-500

- Battle of Lake Erie, 12-†499; 7-211, †484

**Perseids**, meteors, 1-167

**Persephone** (Proserpina), goddess, kidnaped by Pluto, 14-†416, \*417

- grains named after, 9-118

- sculpture by Bernini, 14-\*417

**Persepolis**, ancient city of Persia, palace, 11-29

**Perseus**, mythological character

- Andromeda rescued by, 14-426, \*427

- beheads Medusa, 14-446

- painting of Perseus and Andromeda by Nicias, 11-\*70

- statue of, by Cellini, 12-\*20

**Perseus**, constellation, star maps:

- Jan. and Feb., 1-178-A, 178-B

- July and August, 1-178-G

- March and April, 1-178-C

- May and June, 1-178-E

- Nov. and Dec., 1-178-K

- Sept. and Oct., 1-178-I

**Perseus and Andromeda**, painting by Nicias, 11-\*70

**Perishing, John Joseph**, biography, 12-†554-55

- A. E. F. commanded by, 7-322, 326

- Eisenhower serves under, 12-555-F

- Indian wars, 12-554; 7-280

- portraits, 12-\*554; 7-\*320

**Persia, description and history**, main article, 5-†99-106; general data, 5-106

- animal life

- caracul, 4-296

- area, 5-106

- art, 11-\*27, †28-29; *see also* crafts below

- climate, 5-106

- commerce; industry; transportation, 10-264

- couriers, 10-31, 86, 92

- crafts

- glazed tiles, 12-55; 11-\*27, 28

- inlay, 12-102

- rugs, 12-148, 150, \*153

- disposal of the dead, 1-25

- divisions, 5-106

- flag, color plate, 14-following 570, no. 36

- blacksmith's apron used as flag, 14-572

- government, 5-106

- history, 5-†99-105

- Alexander the Great's conquest of, 5-178; 12-348

- capture of Media, Lydia, Babylon, 5-102

- conquest of Babylonia, 5-97

- conquest of Egypt, 5-72

- conquests in India, 5-379

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Persia, history—continued**

- Cyrus and his followers, 5-103
- decay of empire; later history, 5-105
- Egyptian revolt against, 5-169
- invasions of Greece, 5-160, †162-64, 175
  - map of route taken, 5-150
- relations with Phoenicia, 5-112
- wars with Eastern empire, 5-406
- war with Russia 1829, 6-436
- location, 5-106
- map, 5-584, 580
  - empire under Darius, 5-\*100
- modern people and life, 5-\*100
- musical scale, 12-208
- Omar Khayyam's work, 13-89
- Peacock Throne carried to, 9-432
- people, 5-106
  - racial classification, 5-44
- physical features, 5-106, \*100
- polo originated in, 14-525, \*526
- products and industries, 5-106
  - oil supply, 5-\*100; 9-453; 10-262
  - rug industry, 12-150, 152
- religion, 5-102, 105
- trade, 5-\*100
- writing: key to Old Persian, 5-104
- see also* PERSIANS

**Persian art, *see* Persia, subhead art****Persian cats, 4-\*485-86, †487****Persian Gulf, Asia**

- cradle of civilization at head of, 5-75
- maps, 5-584, 580
- countries adjoining, 5-\*76, \*88
- once a river, 5-394

**Persian Plateau, Asia, 5-336-B****map, 5-580****Persian rugs, 12-148, 150, \*153****Persian Wars, 5-162-64; 12-338-39****Persians, 5-106**

- culture, 5-100
- first appearance in history, 5-100
- horsemanship, 14-525

**"Persians, The," by Aeschylus, 13-34****"Personal Memoirs," by U. S. Grant, 12-538****Perspective**

- early Italian painting, 11-132, 134, 137
- mastery by Flemish painters, 11-193

**Perspective, law of, 1-114****Perspiration, cause, 2-293**

- by-products, 2-366
- humidity affects, 1-241

**"Persuasion," by Jane Austen, 13-208****Perth, Australia, 5-544****Perth Amboy, formerly capital of East New Jersey, 8-251****Peru, country, South America, general data, 5-518-D**

- agriculture, 5-518-D
- animal life, 4-267
- communication problem, 5-516
- area, 5-518-D
- climate, 5-518-D

**Peru—continued**

- divisions, 5-518-D
- economic reforms, 5-516
- flag, color plate, 14—following 570, no. 53
- government, 5-518-D
- history, 5-505, 507, 510, 516
  - Inca civilization, 5-495; 7-†91
  - Spanish conquest, 5-497
  - Pizarro and De Soto in, 13-464
  - liberated by Bolivar, 12-438
- location, 5-518-D
- map, 5-602
- medicinal plants, 9-217
- merchant marine, number, 10-232
- people, 5-518-D
- physical features, 5-518-D
- products and industries
  - cochineal, 9-305
  - cotton, 9-28, 32
  - minerals, 5-518-D
  - gold mines, 5-510
- rivers, 5-518-D
- Spanish district in America, 5-500
- "staircase" farms, 5-\*501
- transportation, 10-185
- whistling jars, 12-\*202

**Perugino, Pietro, art style, 11-143****"Crucifixion," painting, 11-\*142, 143****Raphael a student of, 11-165****Peruvian bark, 9-217****Peruvian Central, railway, 10-185****Peruvian cotton, 9-32****Peruvian Current, 5-518-D****Pessimist, 13-23****Pest, *see* Budapest****"Pest House at Jaffa, The," painting by Baron Gros, 11-\*288, 290****Pests, agricultural, main article, 2-†136-41****Petals of flower, 2-†102-3****Peter, Saint, apostle**

- burial place, 11-\*75
- chair at Rome, 12-181
- meeting with Christ on road from Rome, 10-150
- painting by Dürer, 11-\*210, 211

**Peter I, the Great, czar of Russia, life, main article, 12-†414-15; 6-429, 430**

- introduces Western culture into Russia, 12-415
- portrait, 6-\*428

- St. Petersburg built by, 6-\*429, 430
- war with Sweden, 6-403

**Peter III, czar of Russia, character, 12-417; 6-430**

- and Frederick the Great, 6-222
- death, versions of, 12-417; 6-432
- marries Catherine, 12-416

**Peter bird, 4-62****"Peter Ibbetson," opera by Deems Taylor, 12-257****Peter Island, Antarctica, discovered, 13-506****Peter Leopold (of Tuscany), in Italy, 6-303**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

"Peter Pan," by Barrie, 13-267, 268  
 "Peter Piper," nursery rhyme, 14-174-H  
 Peter the Hermit, and the Crusades, 5-\*280, 282, 409; 6-22  
 "Peter the Pumpkin Eater," nursery rhyme, text, color plate, 14-174-F  
 Peterboro, N. H.  
     library, 8-242  
     MacDowell colony, 12-321  
 Peterloo Massacre, Manchester, England, 6-93  
 Petersburg, Va., 8-417  
 Petersburg, Battle of, 7-\*252  
 Petersburg National Military Park, Va., 8-418-A  
 Petiole, leafstalk, 2-23, 24, \*48  
     lily pad, 2-200  
 Petit Bois Island Bird Refuge, Alabama, 8-8-A  
 "Petit Chose, Le," by Alphonse Daudet, 13-133  
 Petit Trianon, palace, Versailles, 11-\*489  
 Petite Terre, island, West Indies, 7-64  
 Petition of Right, England, 6-62  
 Petrarch, Francesco, life and work, main article, 13-†61-62  
     crowned with laurel, 6-299  
     description of France, 6-174  
 Petrel, bird, 4-217  
     makes home with tuatara, 3-463  
 Petrie, Sir Flinders  
     account of finding the Treasure of Lahun, 5-8  
     quoted, 11-409  
 Petrified and fossilized trees, 3-\*5, 6; 2-\*257; 9-315  
 Petrified forest, in Yellowstone National Park, 7-406  
 Petrified Forest National Monument, Arizona, 7-\*418, 421; 8-23  
     Eagle's Nest, 7-\*418  
     largest tree, 2-\*16  
     size, location, 8-24-A  
 Petrograd, U.S.S.R., *see* Leningrad  
 Petrol, *see* Gasoline  
 Petroleum, main article, 9-†449-56  
     alcohol a possible substitute, 10-547  
     by-products, 9-271-A, 271-B, 455  
     competition with coal, 9-449  
     composition; meaning of word, 9-450  
     derrick, world's tallest, 9-\*450  
     drilling: oil fields, 9-†449 fol.  
     exhaustion of supply, 9-453; 1-352  
     formation of oil deposits, 9-\*455  
     fractional distillation, 9-\*452, 454, 456  
     "ice-cream" oil well, 8-50  
     largest deposits in world, 7-29-U  
     origin, 9-449; 1-341  
     plastics made from, 10-551, 553; 8-\*383  
     producing regions, foreign, 9-453  
         Abyssinian fields, 5-461  
         Baku fields, 6-368  
         China, ancient, 9-450  
         Europe, 6-162-D  
         Poland's wells, 6-\*453  
         Roumania's exports, 6-360

Petroleum, producing regions—*continued*  
     South America, 5-517  
     producing regions; industry, U. S., 7-343-E; 9-450-52  
         California's production, 8-40  
         Illinois an important distributor, 8-103  
         Kansas, 8-\*139, 130  
         New Jersey, 8-248, \*250  
         Oklahoma, 8-\*317, 319  
         Pennsylvania, 8-†337-38  
         Texas, 8-383  
         West Virginia, 8-433  
         Wyoming, 8-\*450, 451, 452  
     refining, and products that result from, 9-450, \*452, 454, \*455  
     Standard Oil Company, 12-583  
     submarine deposits, 9-\*452  
     Teapot Dome scandal, 12-456-C  
     transportation, 9-\*452, \*453  
 Pets  
     cats, 4-†483-88  
     dogs, 4-†490-503  
     how to make and keep an aquarium, 14-†2-5  
 Petuntse, china stone, 12-43  
 Pewee, bird, graph of song, 4-\*5  
 Pewter, 9-420  
 Pey-Berland Tower, Bordeaux, France, 11-\*461  
 Phaëthon and Apollo, myth of, 14 413-15  
 Phagocytes in blood, 2-344, 349, 350  
 Phalanger family, marsupials, 4-\*467, 468  
 Phalanx, Macedonian, 5-178  
 Phantom Ship, island, Crater Lake, 7-407  
 Phaon and Sappho, 13-31, 32  
 Pharaoh, origin of term, 5-52  
 Pharaoh of the oppression, 5-68  
 Pharaoh's chicken (vulture), 4-161  
 Pharaohs of Egypt, *see* Egypt, ancient; *also* names of pharaohs, as Ikhnaton; Ramses  
 Pharmaceutical botany, 2-2  
 Pharos of Alexandria, lighthouse, 5-\*186, 187  
     built, 10-226  
 Pharsalus, Battle of, 5-224  
 Pharynx, 2-\*337  
 Phases of moon, 1-\*124, 126  
 Pheasants, birds, 4-†187-89  
     game bird, 4-78  
     Oligocene period, 3-53  
     ring-necked pheasant, 4-96, 187  
     *see also* varieties, as Golden pheasant  
 "Phèdre," by Racine, 13-113  
 Pheidippides, Greek runner, 10-†30-31  
     origin of Marathon race, 14-474  
 Phenol (carbolic acid), 9-446, 10-552  
 Phenolic plastics, 10-552  
 Phi Beta Kappa, founding of, 8-417  
 Phidias, Greek sculptor, 11-43-45  
     conspiracy against, 11-46  
     Parthenon the work of, 11-45, 421  
         sculptures, 11-\*43, †44-46  
     statues  
         Athlena of Lemnos, 11-\*42

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Phidias**, statues—*continued*

Athena of the Parthenon, 11-46, 423; 12-84  
Zeus, 5-167, 185; 12-64

**Philadelphia, Pa.**, 8-†335

art institutions, 8-341  
Benjamin Franklin's services to, 12-465  
colonial period, 7-153  
cotton weaving, 9-29  
during Revolutionary War, 8-336; 12-484  
first public library, 12-465, \*467  
harbor, 8-341  
historic buildings, 7-\*356, \*361; *see also* Independence Hall  
institutions of higher learning, list, 8-341  
manufacturing, 8-339  
leather, 7-577  
milk supplied by New Jersey, 8-245  
settlement by William Penn, 12-462  
sky line, 8-\*335  
temperature, 8-341  
water supply, 10-542

**Philadelphia Orchestra**, 8-342

*Philadelphia lewisi*, 8-92-B

**Philae**, Egypt, temple, 5-\*61

**Philanthropy and charity**, *see* Social welfare work

**Philemon and Baucis**, mythology, 14-451

**Philip**, Indian leader, 8-58

**Philip I, the Handsome**, king of Castile, 6-326

**Philip I**, king of France, 6-169

**Philip II (Philip Augustus)**, king of France, reign, 6-169

alliance with Richard the Lion-hearted, 12-373  
leads Third Crusade, 5-283  
war against Otto IV, 5-294

**Philip III, the Bold**, king of France, 6-170

**Philip IV, the Fair**, king of France, reign, 6-170  
at Mons-en-Puelle, 6-\*171

triumphal entry into Bruges, 11-197

**Philip VI**, king of France, 6-27

**Philip II**, king of Macedon

conquest of Greece, 5-177  
defeat by Romans, 5-217  
Demosthenes' attacks, 12-345  
father of Alexander the Great, 12-346  
lays siege to Byzantium, 14-573

**Philip II**, king of Spain, 6-327, \*328

and Mazarin, 6-181

court, 13-77

El Greco's genius wasted on, 11-246

marriage with Mary I of England, 6-48

period of glory, 13-73

proposes marriage to Elizabeth, 6-55

sends Armada against England, 12-397

subdues Portugal, 6-341

treatment of Flanders, 11-217

war with England, 6-56

**Philip IV**, king of Spain

and Velasquez, 11-\*241, 251, 255

arts encouraged by, 11-247; 13-79

relations with Rubens, 11-225

Velasquez's portraits of, 11-247, \*248, 251, \*253

**Philip V (Philip of Anjou)**, king of Spain, 6-329, 331

and war of the Spanish Succession, 6-219

**Philip the Bold**, duke of Burgundy

monastery and tomb, 11-\*92, 103, 105\*

patron of art, 11-103

**Philip the Good**, duke of Burgundy, Jan van

Eyck in service of, 11-197

**Philippa**, queen of Edward III, 6-\*26

befriends Froissart, 13-103

**Philippi, Battle of**, Civil War, 8-434

**Philippi, Battle of**, in Greece, 12-362

"Philippic," origin of word, 12-345

"Philippics" of Demosthenes, 12-345

**Philippine Republic**, South Pacific Ocean, description and history, main article, 5-

†562-69; general data, 5-570

agriculture, 5-570; *see also* agricultural products listed below under products and industries

animal life; bats, 4-\*271

birds; eagles, 4-153

area, 5-570

climate, 5-570

crafts, 5-\*566

education, 5-569; 7-300

flag, color plate, 14-following 570, no. 54

forest products, 5-570

government, 5-570, 569

history, 5-†562-69

Magellan's voyage to, 5-564; 13-463

Spanish rule, 5-564-69

Dewey's victory at Manila, 5-564; 12-540

purchased from Spain, 5-569; 7-297

relations with U. S., 5-569; 7-298

struggle for independence, 5-565, 567-69, 570; 7-298

Mindanao "cleaned up" by Pershing, 12-555

independence, 5-522, 569; 6-556; 7-300

World War II, 5-569; 6-530, 531, 533, 551

communist activity, 6-564

maps, 5-594, 597, 581

minerals, 5-570

Mohammedanism, 8-462, 463

native canoe, 10-\*140

once joined to mainland, 3-61

people, 5-570

native life, 5-\*562-67; 10-\*131; 7-\*116, \*299, \*300

religions, 5-†562

physical features, 5-570

products and industries, 5-570

breadfruit, 9-212

coconuts, 2-\*209

crops, 5-567

Manila hemp industry, 9-\*282, 285, \*287; 7-\*572

pineapple cultivation, 9-186

rice cultivation, 9-\*110; 5-556, \*568

rope making, 9-\*287

rubber, 9-267

tobacco, 9-223

The asterisk (\*) refers to picture and explanation only. The obelisk (†) refers to illustrated text.

- Philippine Islands**--*continued*  
 trade, 5-565; exports, 10-236  
 merchant marine, 10-232  
 transportation, 10-224  
 tree house, 11-\*397
- Philippines Commission**, 5-569
- Philippopolis**, Bulgaria, 6-368-A
- Philip, Arthur**, 5-548, 549, 550  
 and settlement of Australia, 5-†546  
 portrait, 5-\*554
- Philipse, Frederick**, 11-505
- Philistines**, ancient people  
 in Palestine, 5-118  
 war against Hebrews, 5-†122
- Phillips Exeter Academy**, Exeter, N. H., 8-242
- Phillipsburg**, N. J., 8-248
- Phillipse**, old New York name, 8-275
- "Philoctetes,"** by Sophocles, 13-30
- Philology**, *see* Language and languages
- Philomela**, mythological character  
 changed into nightingale, 14-453  
 story woven by, 12-140
- "Philomela,"** by Matthew Arnold, 13-255
- Philosophers**  
 biography, 13-†1-25  
   Bacon, Francis, 13-†150-52  
   Bacon, Roger, 13-†374  
   Boethius and his book, 13-58  
   Descartes, René, 13-†13  
   Hume, David, 13-16  
   Kant, Immanuel, 13-†21  
   Leibnitz, Gottfried Wilhelm von, 13-†14  
   Marcus Aurelius, 13-57  
   Pascal, Blaise, 13-†108  
   Rousseau, Jean Jacques, 13-†17  
   Schopenhauer, Arthur, 13-†23  
   Smith, Adam, 13-†19-21  
   Spencer, Herbert, 13-†24  
 effect of Copernicus' studies, 13-393  
**Greek**, 13-†1-12; 5-160, 172  
   use of reason, 1-531  
   *see also names of philosophers in index, as*  
   Anaxagoras; Aristotle; Pythagoras  
   India, 5-366, 369
- Philosopher's Walk**, Königsberg, 13-22
- Philosophy**, meaning of word, 13-1  
 how we learned to think, 13-†1-12  
 ideas; concepts, 13-8
- Philosophy of the golden mean**, 13-10, 51
- Phin, John**, "The Seven Follies of Science," 1-315
- Phipps, James**, 13-366
- Phipps, Sir William**, 7-7
- Phloëm**, botany  
 food carried by, 2-236  
 leaves, 2-26  
 stem, 2-\*29, 30, 32, \*33
- Phobos**, moon of Mars, 1-151
- Phobos**, mythological character, 1-149
- Phocis**, district of Greece, on map, 5-\*150
- Phoebe**, bird, 4-†41  
 graph of song, 4-\*5  
 nest building and breeding, 4-42
- Phoebe**, moon of Saturn, 1-156
- Phoebus Apollo**, *see* Apollo
- Phoenicia**, ancient country, Syria, **description and history**, main article, 5-†108-12  
 a trading and seafaring people, 5-109; 10-162  
 art objects, 5-194  
 candles, 10-389  
 Carthaginians from, 6-319  
 civilization in North Africa, 5-454  
 contributions to world, 5-110  
 costume, 5-110  
 descendants of, in Malta, 6-†77  
 glass discovered by, legend, 12-26  
 Greeks learn writing from, 5-153  
 ironwork, 12-2  
 jewelry, 12-\*118  
 maps, 5-112, 48  
 oars and sails in ships, 10-163  
 race, 5-43  
 trade, 5-109; 10-162  
   Bohemia, 6-358  
   Britain; tin from, 6-4  
   Etruscan, 5-194  
   Greece, 5-153  
   iron, 12-2  
   Spain, 6-318
- Phoenician numerals**, 10-\*422
- Phoenician writing**: alphabet, 5-111; 10-\*42  
 fol
- Phoenicians**, ancient people, *see* Phoenicia
- Phoenix**, Arizona, 8-18, 22
- Phoenix**, fabulous bird, 12-125, 5-308; 6-445
- Pholas**, mollusk, 3-†154
- Phonetic alphabet**, 10-\*44, 45
- Phonograph**, invention of, main article, 10-†497-500; 1-†443-45  
 Camden manufactures, 8-247  
 meaning of word, 10-498  
 model of first, 1-\*444  
 needle, 1-444; 10-498, 500  
 use in sound pictures, 10-504
- Phonograph records**, 1-443; 10-498  
 material used for, 2-258  
 "talking books," 10-560
- Phosphate fertilizers**, 7-454
- Phosphates**, 1-97  
 Africa, 5-473-B  
 Florida, 8-73  
 South America, 5-518-B  
 United States, 7-343-F
- Phosphorescence**, 2-17  
 glowworm, 3-343  
*see also* Luminescence
- Phosphorus**, element  
 in matches: danger to workers, 10-332  
 low kindling point, 1-385  
 necessary to plants, 10-546  
 symbol, atomic no. and wt., 1-\*551
- Photo-electric cell**  
 responds to starlight, 1-414

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Photo-electric cell—continued**

- uses, 1-**\*412**, 414, **\*415**
- long-distance photography, 10-94
- sound pictures, 10-504
- television, 10-124

**Photoelectric tube**, 1-**†563****Photo-engraving**, 10-**†67-71****Photo-period**, effect on plants' flowering, 2-223**Photograph**, *see* Photography**Photographic plates**, 10-**†448****Photography**, main article, 10-**†446-52**

- aerial, 10-452, 368; 5-**†432**
- by wire, 10-**\*94**, 99
- cameras; uses, 10-452
- compared with painting; rivalry, 11-330-31
- daguerreotypes, 10-448
- developing and printing, 10-**\*450**, **†451**
- earliest developments, 10-446
- first "cameras," dark rooms, 10-447
- how a photograph is made, 10-**\*449**, **†450-51**
- negative, 10-**\*450**, **†451**
- trick photograph, 10-447, **†449**
- underlying principles, 10-448
- use by astronomers, 1-**†188**
- see also* Moving pictures

**Photography**, X-ray, 10-**\*493**, **†494**, **\*495****Photons**, in theory of light, 1-420**Photoplays**, main article, 10-**†506-12****Photosphere** of sun, 1-117**Photostat**, 10-452**Photosynthesis**, of plants, main article, 2-**†40-46**

- how it differs from breathing, 2-41, 50
- importance to life, 2-41, 53
- isotopes used in research in, 1-558-11

**Phrenology**, Gall's discoveries, 2-383, 388**Phrygians**, ancient people, 5-403; 11-420**Phyfe, Duncan**, furniture by, 12-**\*197**, 198**Phyllopoda**, crustaceans, first appearance on earth, 3-64**Physical chemistry**, 10-545**Physical education**, main article, 14-**†414-21**

- games, 14-**†165-74**
- sports, 14-**†464-540**

**Physical exercises**, *see* Exercises**Physicians and surgeons**

- biography, 13-**†357-72**
- Galen, Claudius, 13-**†358-59**
- Harvey, William, 13-**†360**
- Hippocrates, 13-**†357-58**
- Hunter, John, 13-364
- Jenner, Edward, 13-**†365**
- Lister, Joseph, 13-**†372**
- heroism, 2-364-365

**Physicists**, biography, 13-379-**†408**

- Einstein, Albert, 13-**†408**
- Faraday, Michael, 13-**†385**
- Kelvin, William T., 13-390
- Priestley, Joseph, 13-390
- Tyndall, John, 13-389

**Physics**, main article, 1-**†280-483** (*see also* Contents Volume 1 and also entries under main subjects listed below)**Physics—continued**

- air pressure, 1-**†452-56**
  - air pressure appliances, 1-**†458-65**
  - atmosphere, 1-**†372-77**
  - atoms and molecules, 1-**†354-61**
  - automatic scales, 10-**†372**
  - defined, 1-284
  - electricity, 1-**†493-528**
  - energy, sources and conservation, 1-**†343-52**
  - energy and work, 1-**†333-41**
  - force, *see* Force
  - friction, 1-**†315-21**
  - gravitation, 1-**†299-304**
  - heat, 1-**†379-86**
  - transmission, 1-**†395-400**
  - light
    - and color, 1-**†436-41**
    - behavior of, 1-**†422-41**
    - nature and theories of, 1-**†412-20**
  - liquids at work, 1-**†363-70**
  - Lord Kelvin's importance to, 13-391
  - machines, principles of simple, 1-**†323-31**
  - magnets and magnetism, 1-**†485-91**
  - matter, origin and nature, 1-**†280-84**
  - expansion and contraction, 1-**†476-83**
  - physical states, 1-**†402-10**
  - motion, laws of, 1-**†286-92**, **†306-13**
  - radium, 9-**†424-26**
  - relativity theory alters science of, 13-409
  - sound, 1-**†443-50**
  - speed of falling bodies; force and motion, 1-**†294-97**
  - temperature measurement, 1-**†388-93**
  - weight, 1-**†467-74**
  - work and energy, 1-**†333-41**
  - X ray, 10-**†492-95**
- Physiological botany**, 2-4
- Physiology**, human, main article, 2-**†278-397**  
(*see also* Content Volume 2 for chapter headings, and also entries under main subjects below)
- blood, color plates, 2-frontispiece, **\*327**
  - circulation, 2-**†369-81**
  - composition and functions, 2-**†344-50**
  - breath and breathing, 2-**†333-42**
  - cause of life in human body, 2-**†278-80**
  - cell division, 2-279
  - digestive process, 2-**†352-58**, color plates, **\*278**, **\*326**
  - nervous system, 2-**†392-97**
  - senses and sensation
    - balance, 2-**†282-85**
    - hearing, 2-**†302-5**
    - muscle sense ("sixth sense"), 2-285
    - sight, 1-**†436-41**; 2-295-300, color plate, **\*278**
    - taste and smell, 2-**†307-9**
    - touch, 2-291, 292, **†295**
  - structure and functions
    - brain, 2-**†383-90**, color plates, **\*278**, **\*326**
    - muscles, 2-**†326-31**, color plate, **\*326**
    - skeleton, 2-**†318-24**, color plates, **\*278**, **\*327**
    - skin, 2-**†287-93**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

**Physiology, structure—continued**

- teeth, 2-†311-16, color plate, \*278  
 transformation and use of food, 2-†360-67  
*see also* Anatomy
- Pia mater**, anatomy, 2-\*387, \*394
- Pianists, outstanding**, 12-245, 246  
 Chopin, Frédéric François, 12-293  
 Liszt, Franz, 12-298  
 Paderewski, Ignace Jan, 12-\*256  
 Rubinstein, Anton, 12-311
- Piankhi**, king of Ethiopia, conqueror of Egypt, 5-69
- Piano** (pianoforte), 12-258-D, 234  
 ancestors, 12-\*221, 222  
 Chopin's compositions for, 12-293  
 pitch, 1-448  
 sounding board, 1-449  
 vibration of strings, 2-305
- Pianoforte**, meaning, 12-258-D
- Piassava**, palm, 9-191
- Piast, house of**, rules Poland, 6-445
- Piazzi, Giuseppe**, discovers planetoid, 1-152
- Picaresque novels**, 13-†116, 191
- Picasso, Pablo**, painting, 11-\*388, 390
- Piccard, Auguste**  
 ascent into stratosphere, 1-456  
 portrait, 10-\*327
- Piccini, Niccolò**  
 opera, 12-237  
 rival of Gluck, 12-272
- Piccolo**, small flute, 12-258-A
- Pichincha**, volcano, Ecuador, 5-518-F
- Pickarel**, fish, 3-238
- Pickering, Edward Charles**, catalogues stars, 1-171
- Picketing**, 7-\*560, 563
- Pickett, George E.**  
 at Cemetery Ridge, 7-263  
 portrait, 7-\*257
- Picks**, devices for plucking strings of musical instruments, 12-258-D
- Pickwick Dam**, 8-371
- "Pickwick Papers,"** by Charles Dickens, 13-\*242, †244
- Picts**, ancient people  
 Britain, 6-3, 4  
 conquered by Celts in Ireland, 6-143  
 Scotland, 6-111  
 driven into, 5-268  
 Shetland Islands; traces, 6-486
- Picture frame**, how to make, 14-†52
- Picture memories**, 2-300
- Picture writing**, 10-†35-38  
 American Indian, 10-†36; 7-108  
 Chinese, 10-†37; 5-315, 327  
 Egyptian, 10-†38 fol.; 5-49  
 Hittite, 5-115  
 Japanese, 10-†37  
 Scandinavian, 6-373, \*374  
 Sumerian, 5-78  
 trade marks, 10-37
- Pictured Rocks**, Michigan, 8-186-A

**Pictures**

- early medium of Christian teaching, 11-88  
 how to make, *see* Drawing  
 mosaic, 12-109, 111; 11-79  
 on glass, 12-77  
 reproduced by electric current (television), 10-†123-26  
*see also* Moving pictures; Painting; Photography
- Piddock**, mollusk, 3-†154
- Pidgin English**, dialect, 10-\*7
- Piebald chuckawalla**, lizard, 3-\*463
- "Piece of String, A,"** by Guy de Maupassant, 13-134
- Pied-billed grebe**, bird, 4-\*108, 110
- Pied hornbill**, bird, 4-\*11
- "Pied Piper of Hamelyn,"** fairy tale, text, 14-†229-31  
 color plates, 14-frontispiece, \*230
- Piedmont**, state, Italy, 6-301  
 and unification of Italy, 6-305 fol.
- Piedmont Plateau**, U. S., 8-411  
 Alabama, 8-2  
 Georgia, 8-80  
 North Carolina, 8-290  
 Pennsylvania, 8-340  
 South Carolina, 8-356  
 Virginia, 8-418  
 characteristics of section, 8-414  
 climate and lumber, 8-415
- Pier**, in arch, 11-\*428, 469
- Pierce, Franklin**, president of United States, 12-456-D  
 puts Hawthorne in consular service, 13-301
- Pierce, Jane Means Appleton** (Mrs. Franklin Pierce), 12-562
- Pierluigi, Giovanni**, *see* Palestrina
- Pierpont, Morgan Library**, New York, 8-284
- Pierre**, S. Dakota, 8-358  
 State Capitol, 8-\*358  
 temperature, 8-364
- Pierre, Fort**, S. Dakota, 8-360
- Pierrot**, comedy character, 12-329
- Piers**  
 New York City piers, 10-\*198, †294  
 of bridges, 10-210
- "Piers Plowman,"** poem, influence of, 6-33
- Pietà**, sculpture, by Michelangelo, 11-\*155, \*161
- Pig deer**, *see* Babirusa
- Pig-faced baboon** (chacma), 4-†259
- Pig iron**, 9-†401
- Pig skin water bottles**, 6-\*315-A
- Pig-tailed monkey**, 4-\*254, 257
- Pigeon hawk**, 4-154
- Pigeons**, birds, 4-\*77, \*79, †80, †144-46  
 before St. Mark's, Venice, 6-\*312  
 carriers, 4-\*13  
 largest, 4-\*77  
 nest building, 4-146  
 protected in Mecca, 5-†419  
 squab a delicacy, 9-359

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Pigeons—continued**

see also names of various kinds of pigeons, as  
Fan-tailed pigeon; Nutmeg pigeon

**Pigment**

eye color, 2-297  
feathers lacking in, 4-188  
hair, 2-290, 345  
lack of, in birds, 4-188, 227  
results of mixing, color plate, 1-\*434, 440  
skin, 2-288, 345

**Pigmies**

African Negroes, 5-445, 467, \*468-70  
gift of a pigmy to P'epi II, 5-56  
black, 8-570; see also Negritos  
East Indians, 5-523, 525  
Malayans, 5-\*28, 425; 8-462

**Pigmy anteater**, 4-451, 452**Pigmy elephant**, 4-340, \*342**Pigmy hippopotamus**, 4-\*438, 439**Pigmy hog**, 4-434**Pigmy marmoset**, 4-267**Pigmy parrot**, 4-192**Pigmy rhinoceros**, 4-348**Pigmy shrewmouse**, 3-70; 4-281**Pigs**, see Hogs**Pigskin**, 9-72**Pike, Zebulon Montgomery**

Minnesota, 8-191

Pike's Peak, 8-48

**Pike, fish**, 3-238 fol**Pike's Peak, Colorado**, 8-47

discoverer, 8-191

goal of fifty-miners, 7-276, 277

view, 2-\*187

**"Pike's Peak or bust,"** origin of expression, 8-48**Pikes**, California immigrants 8-212-B**Piki, Indian bread**, 9-239**Pilate, Pontius**, Jesus brought before, 5-†132**Pilâtre de Rozier, Jean François**, first balloon passenger, 1-468**Pilchard**, fish, 9-366**Pilcomayo, river**, rising in Bolivian highlands, flowing across the Chaco to the Paraguay River

floods, 5-518-A

length, 10-253

map, 5-602, 604

**Pile**, of rugs, 12-152**Pileated heron**, bird, 4-\*102**Pileated woodpecker**, bird, 4-69, \*70**"Pilgrim Exiles,"** painting, 7-\*129**"Pilgrim Maiden,"** statue by Henry H. Kitson, 11-\*376**Pilgrimages**

medieval, 11-90

to Mecca, 5-416-23; 13-521, 523

**Pilgrims**, voyage and settlement, 7-†124-25, \*126, \*127, \*129; 8-165-67

celebration of Thanksgiving Day, 14-\*587, †588

fort and meeting house, 11-\*497

Mayflower Compact, signing, 7-\*127

**Pilgrims—continued**

Pilgrim Fathers on the "Mayflower," 7-\*127; 10-\*23

village of Plymouth, 11-\*498

**Pilgrims' Chorus**, from "Tannhäuser," 12-251**"Pilgrim's Progress,"** by John Bunyan, 13-171**Pillar**, the first, 11-417; see also Column**"Pillar of Hercules,"** Oregon, 1-\*21**Pillar of laws**, Babylonian, 5-86**Pillsbury, Harry Nelson**, chess game, 14-490**"Pilot, The,"** by Cooper, 13-297**Pilot boats**, Dutch, 14-528**Pilotless planes**, 10-328-R**Pilsudski, Joseph**, Poland governed by, 6-454**Piltown, England**, fossil man found at, 5-\*25, \*30; 3-57**Pin**, the first, 9-50**"Pinafore,"** operetta by Gilbert and Sullivan, 12-320**Pinchot, Gifford**, reforestation, 7-310**Pinckney, Charles**, American statesman, 12-\*496**Pinckney, Charles Cotesworth, General**, American revolutionary officer and statesman, 12-\*496**Pinckney, William**, 12-456-G**Pindar**, Greek poet, house spared, 5-178**Pindus Mountains**, Greece, map, 6-595**Pine**, tree, 2-\*266

disease, where harbored, 7-157

generic name, 2-183

needles, 2-98

products from, 9-309, 312; 10-547

treatment of seeds, 2-218

wood and its uses, 9-258

young pine forest, 2-\*240

**Pine beetle**, tree carved by grub of, 3-\*331**Pine marten**, 4-\*357**Pine Mountains**, Kentucky, 8-138-A**Pine needles**, 2-98**Pine nut**, 9-201, 204; 2-97**Pine Ridge Mountains**, Neb., 8-228**Pine siskin**, bird, 4-\*127, 128**Pine snake**, 3-500**Pine tree flag**, 14-574**Pine Tree State**, nickname for Maine, 8-156-A**Pineapple**, main article, 9-†185-86

a multiple fruit, 2-122

cultivation in Hawaii, 9-185, †186; 8-\*459

fabric made from leaves of, 9-186

fruit, 2-\*118

growing and canning, 9-\*230

leaves of, a protection against animals, 2-\*207

propagation, 9-†186

ripened by ethylene, 2-219

**Pineapple family**, epiphytes, 2-†150**Pineda, Alonso Alvarez de**, explorer, 8-141**Pines**, section of New Jersey, 8-246**Pines, Isle of**, Caribbean Sea, map, 7-600**Pinion**, in automatic scale, 10-\*372**Pink and white moccasin flower**, see Lady's-slipper**Pink beryl**, semi-precious stone, 9-433

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Pink bollworm**, 9-34  
**Pink-crested bee eater**, bird, color plate, 4-\*185  
**Pink curlew** (roseate spoonbill), bird, 4-148  
**Pink dye**, 12-157  
**Pink family**, botany, characteristics; members, 2-164  
**Pinks**, flowers, 2-230  
**Pinnacle**, architecture, 11-469  
**Pinnacles National Monument**, 8-42-B  
**Pinnate leaves**, 2-24, 25  
**Piñons**, pine nuts, 9-201, 204; 2-97  
**Pinsk**, Poland, average temperature, 6-454-B  
**"Pinta,"** ship of Columbus, 13-†450  
**Pintail duck**, 4-119, \*120  
*Pinus strobus*, 8-156-A  
**Pinzón, Martin Alonso**, and brothers, accompany Columbus, 13-450; 7-114  
**Pinzón, Vicente**, discovery of Brazil, 5-497  
**"Pioneer,"** first sleeping car, 10-196  
**"Pioneer, The,"** magazine founded by James Russell Lowell, 13-313  
**Pioneer Day**, holiday in Utah, 8-396-A  
**Pioneer National Monument**, Kentucky, 8-138-B  
**Pioneers and pioneer life**  
   American colonies, 7-†121 fol., \*146, \*147  
   Boone, 12-†469-72  
   fur traders pave the way, 7-231  
   gold rushes, 7-239, \*276  
   Kentucky, 12-†471  
   morals, 7-215  
   prairies, 7-233  
   river travel, 7-214-15  
   Tennessee mountains, 7-\*223, \*224  
   trails and routes West, 8-449  
   transportation, 10-\*146, 148  
   Western, 7-214, 215, \*225, †231 †232, †233-34, \*276  
**"Pioneers, The,"** by Cooper, 13-296, 297  
**Pipe lines** for oil, 9-\*452, 454; 8-384  
**Pipe organ**, 12-258-D  
**Pipe Spring National Monument**, Ariz., 8-24-A  
**Pipefish**, 3-214  
**Pipes**, corn-cob, manufacture, 8-212  
**Pipes**, metals used for, 9-418, 419  
   seamless, 9-\*407  
   water, 10-538  
**Pipes of American Indians**, 9-221  
   pipe of peace, 7-106  
**"Piper of Hamelyn,"** fairy tale, text, 14-†220-31, color plate, frontispiece  
**Pipes of Pan**, 14-438  
**"Pipes of Pan,"** by Bliss Carman, 13-579  
**Piping plover**, bird, 4-116  
**Pipistrelle bat**, 4-\*275  
**Pipit**, bird, 4-\*170, \*224  
**"Pippa Passes,"** by Robert Browning, 13-252  
**Pippin of Héristal**, Frankish Mayor of the Palace, 6-167  
**Pippin the Short**, Frankish king, 6-167  
   and use of organ, 12-258-D  
**Piraeus**, harbor of Athens, 5-169  
**Piranesi, Giambattista**, 10-65  
**Pirates and piracy**  
   Barbary Coast, 5-454; 9-206; 13-76  
   buccaneers in the Caribbean, 7-42; 10-169, 170  
   famous individuals, 10-170  
     Francis Drake, 5-501; 10-169  
   Iceland ravaged by, 6-420  
   India, 5-379  
   Mexican history, 7-81  
   North Carolina, 8-288  
   Philippines, 5-564, 565, 567  
   South America, 5-501  
   vikings plunder European coasts, 10-166  
   West Indies, 7-†50, 53, 54  
**Pirates' den**, how to make, 14-†6  
**"Pirates of Penzance, The,"** operetta by Gilbert and Sullivan, 12-320  
**Pirithous**, mythological king of the Lapithae, 14-448  
**Pisa, Italy**  
   cathedral, 11-\*454  
   sculptured pulpit, 11-107, †108  
   Leaning Tower (campanile), 11-\*454; 1-\*290  
   Galileo's experiment from, 1-\*290, 292  
   Middle Ages, 6-296, 297  
**Pisanello da Verona** (Vittore Pisano), painter, 11-172  
**Pisano, Andrea**, carvings, 11-124  
**Pisano, Antonio**, bronze work, 12-22  
**Pisano Giovanni**, carvings, 11-†109, \*110  
**Pisano Niccola**, art style, 11-†107-9  
   contemporaries, 6-299  
**Piscataway Indians**, Maryland tribe, 8-159  
**Pisces (Fishes)**, constellation, 1-†78  
   star maps  
     Jan. and Feb., 1-178 B  
     Nov. and Dec., 1-178-L  
     Sept. and Oct., 1-178 J  
   zodiac, 1-170  
**Pishkun Bird Refuge**, 8-220-A  
**Pisistratus**, tyrant of Athens, 5-160  
   and Aesop, 13-41  
   seizes power of government, 12-337  
   son, 5-162  
**Pissarro, Camille**, paintings by, 11-344, 345, 348  
**Pistachio nut**, 9-204  
**Pistil of flowers**, 2-102-3, \*172  
**Pistol**  
   of sixteenth century, 10-\*355  
**Piston, Walter**, composer, 12-257  
**Piston**  
   automobile, 1-†287; 10-†288  
   Diesel engine, 10-\*276  
   pump, 1-\*464, 465  
   steam engine, 10-\*397, 398  
**Piston pin**, Diesel engine, 10-\*276  
**Piston rings**, Diesel engine, 10-276  
**"Pit, The,"** novel by Frank Norris, 13-346  
**"Pit and the Pendulum, The,"** by Poe, 13-315  
**Pit River**, Calif., 8-42

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Pit viper**, 3-490  
**Pita**, plant, 2-150  
**Pitcairn Island**, So. Pacific Ocean, 5-529  
**Pitch**, from petroleum, 9-445  
     uses, 9-313  
**Pitch**, of sound, 1-†448-49  
**Pitch Lake**, Trinidad, 7-54-B, 66  
**Pitchblende**, mineral, radium refined from, 1-283; 9-426  
**Pitcher**, Molly (Mary Hays), services at Battle of Monmouth, main article, 12-†492-93  
**Pitcher**, in baseball, 14-504  
**Pitcher**, vessel, 12-\*33  
**Pitcher plants**, insects trapped by, 2-61, \*64  
**Pitching**, baseball, 14-504, 505  
     pitcher's box diagram, 14-\*506  
**Pith** of plant, 2-†29, \*33, \*48  
**Pithecanthropus**, prehistoric man, restoration, 5-\*25  
*Platycodonium samman*, tree, 2-261  
**Pitt, William**, earl of Chatham, power and influence, 6-81  
**Pitt, William, the Younger**, 6-93  
     oratory, 13-201  
**Pittsburg**, Landing, hamlet, Tenn., military park, 8-374  
**Pittsburgh** Pa.  
     formerly site of Fort Duquesne, 7-143  
     industries, 8-338  
**"Pittsburgh of the West,"** 8-52  
**Pittsfield**, Mass., 8-174  
**Pituitary gland**, anatomy, 2-324, \*385  
**Pius IV**, pope, and Palestrina, 12-206  
**Pius IX**, pope, and Liszt, 12-297  
**Pius XII**, pope, 6-\*467  
**Piute Indians**, 7-\*105  
     natural bridge on reservation, 8-396-A  
     phase describing their people, 8-396-A  
**Pivot joint**, anatomy, 2-324  
**Pixy purses**, egg cases of fishes, 3-210  
**Pizarro, Francisco**, conquest of Incas, 5-497, †498; 7-92, 117  
     and Charles V., 7-\*117  
     and De Soto in Peru, 13-404  
**"Place d'Armes,"** square in New Orleans, 8-142  
**Place d'Etoile**, Paris, 11-\*291  
**Placer mining**, gold, 9-393, \*395  
**Plague**  
     disease  
         London, 13-174  
         Norway, 6-388  
         *see also* Black Death  
     locust, 3-368  
**Plaice**, fish, 3-202  
**"Plain Tales from the Hills,"** by Rudyard Kipling, 13-269  
**Plainfield**, N. J., industries, 8-248  
**Plains**  
     arid plains or deserts, *see* Deserts  
     llanos, 5-518-B  
     pampas, 5-518-B  
     prairies, *see* Prairies  
**Plains- continued**  
     steppes, 6-443-A, 162-C  
     tundras, *see* Tundras  
     United States, 7-343-C  
         coastal, *see* Atlantic Coastal Plain; Gulf Coastal Plain  
         *see also* names of plains, as Great Plains  
**Plains**, section of New Jersey, 8-246  
**Plainsboro**, N. J., dairy, 8-245  
**Plainsong**, chants, 12-212  
**Planck, Max**, studies of light, 1-420  
**Plane**, tool, how to use and care for, 14-†24, †26  
**Plane**, inclined, *see* Inclined plane  
**Plane tree** (American sycamore), 2-†274  
**Planer**, Minna (Frau Richard Wagner), 12-294  
**Planet**, *see* Planets  
**Planetarium**, 1-†190-91  
**Planetary motion**, laws of, 1-106, 289  
**Planetary nebulae**, 1-183  
**Planetesimal Hypothesis** of solar system, 1-9  
**Planetoids**, 1-152  
     color plate, 1-98  
**Planets**, main articles: **inner planets**, 1-†145-52;  
     **outer planets**, 1-†154-59; table giving general data, 1-106  
     bulge around center, 1-132  
     color plate, 1-98  
     composition determined by spectroscopy, 1-†187  
     difference between stars and, 1-105, 175  
     distance from sun and earth, 1-106  
     evidences of one destroyed, 1-6  
     Kepler's laws of planetary motion, 13-390; 1-289  
     largest, 1-154  
     length of year and day, 1-106  
     list, table, 1-106  
     minor planets, 1-6  
     moons, *see* Moon of earth; Moons of planets  
     movement around sun, 1-†288-90  
     "music of the spheres," 13-4  
     origin and formation  
         Nebular Hypothesis, 1-\*5, 6  
         Planetesimal Hypothesis, 1-9  
         tidal theory, 1-†7  
     origin of word, 1-106  
     reflection of sunlight, 1-105  
     rotation, 1-9  
     size, 1-\*16, 106  
     smallest, 1-146  
     speed of motion, 1-146, 148, 150, 154, 157 fol., 289  
     **sun's relation to**, 1-†105-6, \*150  
     *see also* Astronomy; Stars, and names of planets, as Earth; Mars  
**Plank, Margaret E.**, state song by, 8-302-A  
**Planken, Frans van der**, tapestry works, 12-143  
**Plant breeding**, main article, 2-†226-33; 13-416  
     aided by Mendel's laws of heredity, 13-413  
     cross breeding, 13-416  
**Plant ecology**, 2-4

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Plant lice (aphids)**  
domesticated by ants, 3-324, †325  
insect destroyers of, 3-282, 335, 365, 382
- Plant pathology, 2-4**
- Plantagenets, English royal house, 6-21**  
end of rule, 6-34
- Plantain, green banana, 2-256; 9-183**
- Plantain bat, 4-275**
- Plantation, civil division, Maine, 8-156**
- Plantation State (Rhode Island), 8-347**
- Plantations, Southern United States, colonial**  
life, 8-408, 410; 7-153, 246  
disappearance, 8-415  
Negro life, 9-†28  
North Carolina, 8-293
- Planters, Virginia's early aristocracy, 8-408-9,**  
410, 412
- Plants, main article, 2-†1-276 (see also Contents**  
Volume 2 for chapter headings)  
absorption of moisture, 1-254  
**adaptation to environment, 1-†187-90**  
desert and arctic plants, 2-†203-7  
affected by length of day; experiment, 2-\*257  
American origin, 2-333  
appear before animal life, 3-6  
aquarium, 14-3  
Asia's vegetation, 5-336-C  
bacteria, 2-†12-21  
blossoming time, 2-†221-24  
breathing of, 2-†48-53  
buds, 2-†131-34  
cell structure and division, 2-†6-10  
chemicals necessary to, 10-545  
classification begun by Theophrastus, 2-3  
classified by Linnaeus, 2-182-85; 9-175; 13-411  
coal formed from remains of, 1-341  
conifers, 2-†94-99  
cotton, 9-28, †32  
cultivation of new and superior kinds, 2-†226-33  
diagram of plant in first year, 2-\*48  
diatoms, 1-51, \*52  
dicotyledons, 2-157  
digestion, 2-53  
**diseases and pests, 2-†136-41**  
destruction by spraying, 2-†139  
domesticated by Indians, 7-123  
**dormancy, 2-†216-19, 207**  
means of overcoming, 2-219  
dyes made from, 12-157  
effect of climate on, 2-†192-97  
enlarged under microscope, 10-\*487-89  
European vegetation, 6-162-D  
ferns and fern allies, 2-†87-92  
first land plants, 3-22  
flowers, 2-†101-4  
Apetalae, 2-†157-60  
Gamopetalae, 2-†170-75  
Polypetalae, 2-†162-68  
food manufacture (photo-synthesis), 2-†40-46, 49, 53  
food requirements, 2-235
- Plants—continued**  
foods from, *see articles listed in Contents*  
Volume 9 and also names of foods, as Oats;  
Rice  
fruits, 2-†118-22  
how formed, 2-115-16  
fungi, 2-†71-76  
gases absorbed and given off by, 2-50  
giants and pigmies, 2-†249-53  
grafting, 2-†231  
grasses, 2-†177-80  
Gray, Asa, studies and books, 13-412  
green coloring matter in, 2-41, 43  
growing on animals, 4-452  
growing season, 1-211; 2-256  
arctic region, 2-195  
temperate zone, 2-196  
growth, use of electric light, 1-\*345, 347  
how fossilized, 3-5  
how sugar is made and used by, 2-236  
human existence dependent upon, 1-341; 2-1, 41  
insectivorous, 2-†60-64  
introduction of new plants to America, 7-454  
leaves, 2-†23-26  
length of day, 2-223  
lichens, 2-†78-80  
luxuriance of tropical vegetation, 2-258  
mangrove swamps, 3-27  
medicinal, 9-†216-19; 2-90  
monocotyledons, 2-†143-52  
mosses, 2-†82-85  
nitrogen obtained by aid of bacteria, 1-538; 2-21  
North Carolina, 8-294  
one-celled, *see Unicellular organisms*  
oxygen given off by, 1-374  
parasites, 2-†55-58  
parts used for perfumes, 9-301  
plant life in soil, 1-97  
poisonous, 2-151, \*204, 205, 214; 9-290  
pollination, 2-†106-13, 145, 148  
prairie, 2-197  
prehistoric, 2-\*1; 9-†436  
fossilized, 3-\*5, 6, \*29; 2-\*2; 9-\*437  
*see also Prehistoric vegetation*  
products from, *see articles listed in Contents*  
Volume 9 and also names of products, as  
Basketry: Rope  
protective armor, 2-†203-7  
pungent odors, 2-175  
quarantines, 2-141  
**questions about: oddities in plant world, 2-255**  
reproduction, 2-†103-4  
sexual and asexual, 2-83-85, 89  
roots, 2-†35-38  
saprophytes, 2-\*55, †56, 74, 76  
**seeds**  
dispersal, 2-†209-14  
kinds and structure, 2-124-29  
sensitivity, 2-154, \*188, 189  
source of energy for all living things, 2-366

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Plants—continued**

- South American plant life, 5-518-B
- spores, *see* Spores
- stems**, 2-†28-33
  - store sun's energy, 1-341
  - structure, 2-\*48
  - survival of the fittest, 2-190, 204
  - symbiosis, 2-†58
  - temperature's affect on, 2-\*221, \*223, \*224
- tendrill climbers**, 2-†154-55
- transpiration, 2-51, 53
- unicellular, *see* Unicellular organisms
- uses, 2-2; *see also* Plants, foods from; Plants, medicinal
- ventilation necessary to, 2-50
- water content, 2-259
- water plants
  - algae, 2-†66-69
  - flowering plants**, 2-†199-201
  - monocotyledons, 2-149
- see also* plant groups, as Flowers; Trees, and names of plants, as Daisy; Maple tree

**Planula**, animal larva

- coral, 3-102
- hydroid, 3-106, 109
- jellyfish, 3-112

**Plasma of blood**, 2-345, 347, 348**Plassey, Battle of**, 5-382; 6-80**Plasteline**, used in modeling, 5-24**Plaster**, 9-†384; from Egyptian pyramids, 5-50**Plaster of Paris**, 1-54; 9-384

- Plastics**, main article, 10-†551-53
  - butyrate used for "non-shatter" glass, 10-\*551
  - casein used in manufacture, 10-547, 552
  - color plates, 10-542-43
  - cornstalks yield cellulose for, 9-\*294
  - ethylene in, 10-553; 8-\*383
  - soybeans used in, 9-214-A; 10-547

**Plastids of plant cell**, 2-\*7, 8**Plastron**, fencers' chest protector, 14-512**Plastron**, turtle shell, 3-466, \*479**Plata River**, South America, estuary of Paraná and Uruguay rivers, 5-494, 518-A; 10-257**boundary for Uruguay**, 5-518-G**harbors located on**, 5-518-H**length**, 10-253; map, 5-604**Plataea, Battle of**, 5-164**Plate armor**, 10-352**Plate glass**, 9-386; 10-548**Plateau, J. A.**, experiments with moving pictures, 10-502**Plateau**, in physiography, 1-25**Plateau of Iran**, Asia, 5-336-B**Plateau of Tibet**, Asia, 3-336-B**Plated lizard**, 3-447**Platelets**, blood, 2-345, 348**Platform**, political, definition, 7-371**Plating**

- metal, 9-420
- silver, 12-89, 90; 9-389

**Platinum**, metallic element, 9-422**in white gold**, 9-396**Platinum—continued**

- melting temperature, 1-\*392
- symbol, atomic no. and wt., 1-\*551
- Plato**, Greek philosopher, life and works, 13-†5
  - fol.
  - contemporaries, 5-176
- Platoon**, in U. S. Army, 7-479-E
- Platt Amendment** to Army and Navy Bill, 7-297
- Platt National Park**, 8-320-B
- Platte River**, U. S., 8-228, 52-A
- Platypus**, egg-laying mammal of Australia, 4-\*470, 471
- Plautus**, Roman dramatist, 12-325
- Play**, *see* Sports and games; Things to do
- Playas**, in physiography, 8-231
- Playgrounds** made by bower birds, 4-†186
- Playgrounds and parks**, municipal, 7-401
- Playing cards**, early printing of, 10-48
- Playing store**, game, 14-162
- Plays**
  - photoplays, 10-†506-12
  - television, 10-\*123, 124, \*126
  - see also* Drama

**Plaza del Congreso**, Buenos Aires, 5-\*513**Plebeians**, Roman social class, 7-348**"Plebes,"** freshman class, 7-488**Plebiscite**, or popular vote, 6-416**Plectra**, devices for plucking strings of musical instruments, 12-258-D**Pléiade**, French poets, 13-107**Pleiades**, group of stars

- Galileo's discovery, 13-397
- star maps

**Jan. and Feb.**, 1-178-B**March and April**, 1-178-C**Nov. and Dec.**, 1-178-L**Pleiades**, star maidens, 14-\*430, 432**Pleistocene (Glacial) period**, 3-†59-62**forms of life in**, table, 3-64*see also* Glacial epoch**Plenty, Bay of**, New Zealand, map, 5-598**Plesiosaurs**, prehistoric reptiles, 3-40, \*41**Pliers**, mechanical principle, 1-†327**Pliny the Elder**, life, main article, 13-†53-54**alludes to Australia**, 5-544**death**, 13-53; 5-258**story of the discovery of glass**, 12-26**Pliny the Younger**, life, main article, 13-54**letters**, 5-242**ruin of Pompeii** described by, 5-258**Pliocene period**, 3-51, 57**forms of life in**, table, 3-64**rock formation**; table, 1-\*40**Plovers**, birds, 4-†114-17**and crocodiles**, 3-442, \*443**Oligocene period**, 3-53**Plow**, farming implement

- importance, 7-452
- prehistoric, 5-\*32, 35
- pulled by oxen, 9-\*101
- tractor, 7-\*457

**Plow**, star group, 1-178; *see also* Big Dipper

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

**Plum-pudding dog** (Dalmatian), 4-499, \*503  
**Plumage**, *see* Birds, plumage; Feathers  
**Plumbing fixtures**  
  ancient Rome, 12-14  
  palace at Cnossus, 5-146; 11-416  
**Plume worm**, tubes of, 3-\*121, \*122  
**Plumes of egret**, 4-†140, †146  
**Plums**, 9-164, \*165, 166  
**Plumule of plant**, 2-126  
**Plutarch, Greek writer, life and works**, main  
  article, 13-†43-44  
  "Lives," 13-43-44  
  "Moral Works," 13-44  
**Pluto**, planet, 1-159; table, 1-106  
  distance from sun, 1-289  
  place in solar system, color plate, 1-98; table,  
  1-106  
  size, 1-\*16  
**Pluto (Dis)**, god, 1-159, 14-407  
  gives life to Eurydice, 14-432  
  kidnaping of Persephone, 14-†416, \*417; 9-118  
**Plutocracy in the U. S.**, 7-283  
**Plutonium**, element, 1-\*551, \*558-E, 558-G  
**Plymouth, England**, Eddystone Lighthouse, 10-  
  229; 12-†557  
**Plymouth, Mass., modern**, 8-173  
**Plymouth Colony**, 8-165-67; 7-†125  
  early colonial buildings, 11-\*497, \*498  
  first Thanksgiving, 14-588  
  landing of Pilgrim Fathers, 7-125, †126  
  Sir Francis Drake as mayor, 12-405  
**Plymouth Company**, colony in Maine, 8-151  
**Plymouth Rock**, breed of chicken, 9-\*350, \*353  
**Plywood plastic**, 10-552-53; 9-386  
**P. M.**, abbreviation, 10-472  
**Pneumatic chisel**, 9-\*381  
**Pneumatic drill**, manufactured at Phillipsburg, •  
  N. J., 8-248  
**Pneumatic Institution**, Bristol, England, 13-384  
**Pneumatic tubes of Postal service**, 7-400; 10-\*84  
**Pneumonia**  
  bacteria of, 2-\*14, \*17  
  death rate, 2-17  
  oxygen tent used in cases of, 2-\*389  
**Pnompenh**, capital of Cambodia, 5-428  
**Po River**, in Northern Italy, 10-253, 259  
  map, 6-588  
  valley, 6-315-B  
**Pocahontas**, Indian maiden, 7-†122  
  and John Smith, 12-458, †460; 7-122  
  baptism, 7-\*122  
  marriage, 12-\*459, 460  
**Pocahontas coal**, 8-415  
**Pocatello**, Idaho, industries, 8-92  
**Pocket destroyer**, battleship, 6-\*519  
**Pocket gopher**, animal, 4-379, \*380  
**Pocono Mountains**, Pennsylvania, 8-340, 341  
**Pocumtuck Indians**, in Vermont territory, 8-400  
**Poe, Edgar Allan, life and works**, main article,  
  13-†314-15  
  house, 13-\*314  
  portrait, 13-\*314

**Poe, Virginia Clemm** (Mrs. Edgar Allan Poe),  
  13-315  
**"Poems and Ballads,"** by Swinburne, 13-259  
**"Poet at the Breakfast Table, The,"** by Oliver  
  Wendell Holmes, 13-309  
**"Poetical Meditations,"** by Alphonse de Lamar-  
  tine, 13-123  
**"Poetical Sketches,"** by William Blake, 13-212  
**Poetry**  
  and drama, 13-355  
  Apollo the god of, 12-\*205  
  Boileau's rules, 13-114  
  contemporary, 13-347-50, 352-54  
  Druid, 6-144  
  "free verse," 13-327, 348  
  glorious period in England, 6-86  
  Greek, 5-159  
  Icelandic skalds, 6-419  
  Japanese, 5-346, 349  
  meter put aside by moderns, 13-348  
  Michelangelo's, 11-162  
  modernists, 13-353  
  oldest heroic poem in English, 14-318  
  pastoral, 13-150; 9-79  
  peak reached by Shakespeare, 13-157  
  revival of Welsh poetry, 6-141  
  Sidney Lanier's ideas about music and, 13-335  
  *see also names of poets, as* Longfellow, Words-  
  worth  
**"Poetry, a Magazine of Verse,"** magazine  
  founded by Harriet Monroe, 13-347  
**Poets**, game, 14-163  
**Poets' Corner**, Westminster Abbey, 11-\*476;  
  13-144  
**Poet's poet** (Edmund Spenser), 13-149  
**"Poganuc People,"** by Harriet Beecher Stowe,  
  13-319  
**Pogroms of Jews**, 5-138; 6-437  
**"Poictesmes,"** fictitious country invented by  
  Cabell, 13-351  
**Poincaré, Raymond**, 6-202  
**Point à l'Aiguille**, lace, 12-171  
**Point Barrow**, Alaska, 8-16  
**Point d'Angleterre**, lace, 12-170  
**Point de France**, lace, 12-172  
**Point de Milan**, lace, 12-\*169  
**Point de Paris**, lace, 12-172  
**Point lace**, Venetian, 12-166  
**Point Pelee National Park**, 7-29-Q  
**Pointers**, dogs, 4-\*500  
**Pointers** (Dubhe and Merak), stars, 1-178  
  star maps  
  July and Aug. 1-178-G  
  March and April, 1-178-C  
  May and June, 1-178-E  
**Pointillism**, painting, 11-350  
**Poison**  
  animals  
  claws of centipede, 3-265  
  lizards, 3-459  
  scorpions, 3-412  
  sea creatures, 3-90, 111, 137, 144, 168

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Poison, animals—continued**

snakes, 3-483, 484, 485, †489-94, \*497, \*501  
spider, 3-413

toads, 3-421

drugs, 2-396

from nightshade family, 9-145

germ-produced, battled by blood, 2-350

plants, 9-290; 2-\*204, 205

medicinal plants, 9-219

poisonous juices, 2-151, 168

seeds, 2-214

tobacco, 9-221

rings containing, 12-118

waste matter in intestine a cause of, 2-367

**Poison arrows**, 2-396; 3-421, 490, 7-104; 10-350

**Poison gas**

breathed by lungs, 2-339

of bombardier beetle, 3-†337

testing for, 9-\*437

**Poison ivy**, 2-403 04, \*420

**Poison oak**, *see* Poison ivy

**Poisoning**, treatment for, 2-408

ivy or oak, 2-403-04

**Poissy, Conference of**, 6-†174

**Poitiers, France**

statues in Palace of Justice, 11 \*92

windows of cathedral, 12-\*75

**Poitiers, Battle of**, 732, *see* Tours, Battle of

**Poitiers, Battle of**, 1356, 6-27

John the Good captured, 6-172

**Poland, country, Europe, description and history**, main article, 6-†445-54; general data, 6-454-B; *see also* index World War II, 6-493

area, 6-454-B

canals, 10-261

climate, 6-454-B

common people, 6-446 fol

constitution, 6-454-B

costumes, 6-\*447, \*450, \*452

flag, color plate, 14 following 570, no. 55

government, 6-454-B

history, 6-†445-54

power of nobles, 6-446, 448, 449

aids Vienna against Turks, 6-451, \*262, 263

Baltic nations under sway of, 6-459, 460, 462

conflicts with Lithuania, 6-459, 460

Germans in, 6-446

Lithuania united with, 6-447

relations with Russia, 6-450, 451, 454

Wars with Sweden, 6-400 fol., 12-402

Diet established, 6-447

partitions of

first, 6-†451, 222, 264

second, 6-452, 224

third, 6-433, 454, 224; 12-417

Congress Kingdom, 6-454

discontent under Austrian rule, 6-271, 272

independence recognized by Russia, 6-439

republic, 6-454

gains territory from Russia, 6-441

"Corridor," 6-454

invaded in 1939, 6-454

**Poland, history—continued**

relationship with France and Germany, 6-241

industry, *see below* products and industries

Jews in, 5-137, 138

map, 6-604, 571; location, 6-454-B

merchant marine, 10-232

music and musicians, 12-245, †291

people, 6-454-B

racial origin, 6-445

physical features, 6-454-B

products and industries

coal, 6-\*453

minerals, 6-454-B

oil, 6-\*453

salt deposits, 9-411, 414

salt mine and city, 9-\*414

provinces, 6-454-B

religion

conversion to Christianity, 6-445

toleration during Reformation, 6-449

Renaissance, 6-448

rivers, 10-258, 6-454-B

war ruins, 6-\*454-A

**Polar bear**, 4-†319 fol.

why he is white, 4-478

**Polar regions**

climate, 7-33 A

temperate at one time, 3-49

devoid of insects, 3-270

length of day and night, 1-\*199, †202-3

location of magnetic pole, map, 10-\*456

**North Pole**, 13-†493-502, 490

map, 13-502-A

seasons, 1-211

**South Pole**, 13-†503-12, 489

map, 13-502-B

*see also* Antarctic regions; Arctic regions

**Polar Star State**, nickname for Maine, 8-156-A

**Polaris**, star, 1-178

**Polders**, drained lands, 6-355-A, 351, 352

**Pole Star**, 1-178

star maps

July and August, 1-178-G

May and June, 1-178-E

Nov. and Dec., 1-178-K

Sept. and Oct., 1-178-I

**Pole vaulting**, sport, 14-\*473, 476

**Polecat** (skunk), 4-358, †359

Oligocene period, 3-54

**Poles**, people, 6-454-B

**Poles, magnetic**, of earth, *see* Magnetic poles

**Poles**, of magnet, 1-\*487, 488

**Police**, London "bobbies" created, 6-95

**Police department**, city, 7-†39, 3

**Police dog**, 4-\*490, \*494

**Polish "Corridor"**, 6-454

*see also* Danzig

**Political Bureau**, governing body of Russia, 6-443-B

**Political corruption**

big business and politics, 7-281, 282

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

- Political corruption**—*continued*  
 during Harding administration, 7-332  
 municipal government, 7-372, 392
- Political economy**, *see* Economics
- Political parties**, *see* Parties, political
- Political science**, *see* Government
- "Politics,"** by Aristotle, 13-10
- Polk, James K.**, president of the U. S., 12-456-E  
 favors annexation of Texas, 7-236  
 Mexican War policy, 7-237, 238  
 tries to purchase Cuba, 7-294
- Polk, Sarah Childress** (Mrs. James K. Polk), 12-562  
 gown worn by, 9-\*15
- Poll tax**, cause of Peasants' Revolt, 6-32
- Pollaiuolo, Antonio**, sculpture, 11-†138
- Pollard, William**, sugar castor by, 12-\*91
- Pollard, tree**, 2-\*133
- Pollen and pollination**, main article, 2-†106-13;  
 1-376  
 Apetalae, 2-158  
 cross-pollination, 2-106, †108 13  
 hand, 9-190  
 insect, 2-†106-12, 145, 163, 3-\*271, 272, 318  
 water, 2-148  
 wind, 2-111, 113, 145  
 date palms, 9-190  
 evergreens, pollen grains and sacs, 2-\*95, 96  
 flowers, fertilizes ovule, 2-102-4  
 grass, 2-179  
 kinds of grains, 2-107, \*112  
 magnolia, 2-189  
 monocotyledons, 2-144, 148  
 process in rock rose, 2-\*108  
 self-pollination, 2-108
- Pollen baskets** of bees, 3-313
- Pollen case** of flower, 2-\*103
- Polliwogs**, *see* Tadpoles
- Pollux**, star, star maps:  
 Jan. and Feb., 1-178-B  
 March and April, 1-178-D  
 May and June, 1-178-E  
 Nov. and Dec., 1-178-K
- Polo, Maffeo**, 13-446
- Polo, Marco**, life and explorations, main article,  
 13-†445-46  
 description of Japan incorrect, 5-353  
 hook of travels, 13-446; 5-329  
 glass pearl making encouraged by, 12-32  
 imprisonment, 13-\*445, 446  
 portrait, 13-\*446  
 visits Chinese porcelain works, 12-42  
 wealth, 13-446
- Polo, Nicolo**, 13-445
- Polo, game**, main article, 14-†525-26
- Polo ponies**, 14-†525
- Polonium**, element, 9-425  
 symbol, atomic no. and wt., 1-\*551
- Polyclitus**, Greek sculptor, statues by, 11-43  
 "Spear Bearer," Roman copy, 11-\*39, 43  
 "Youth Binding His Hair," sculpture, 11-\*39
- Polycotyledons**, plants, 2-129
- Polydesmus**, millepede, with nest, 3-\*266
- Polygamy**, 8-393; 13-523
- Polygnotus**, Greek painter, 11-49, 58
- Polygon**, geometric figure, 10-439
- Polyhymnia**, muse, 14-412; 12-\*205
- Polymerization**, oil refining, 9-\*452, 454
- Polynesians**, people in Pacific Islands, descrip-  
 tion; origin, 5-520, 521, 531  
 Hawaii, 8-456, 461  
 New Zealand, 5-531, 532  
 Samoa, 8-466, 467
- Polynices**, mythological character, 14-454
- Polypetalae**, plant division, main article, 2-  
 †162-68  
 families and species, 2-164, 168
- Polyphemus**, giant, in "The Odyssey," 13-30
- Polyphemus moth**, 3-\*294
- Polyphony**, *see* Counterpoint
- Polypody**, fern, 2-87
- Polyporus conchifer**, fungus, 2-\*75
- Polyps**, sea creatures  
 coral, 3-97 fol.; 1-56  
 how they are born, 3-102  
 hydroid, 3-105, 109, 110  
 Ordovician period, 3-13  
 similarity coral and hydroid polyps, 3-105
- Polystyrene plastics**, 10-553
- Polytrichum commune**, moss, 2-83
- Pome**, fruit, 2-121, 122
- Pomegranate**, plant, structure of flower, 2-\*102
- Pomerania**, prov., Germany, map, 6-583
- Pomeranian dog**, 4-\*495
- Pomeranian bay**, Germany, map, 6-583
- Pomo Indians**, 7-\*105
- Pomona**, Roman goddess, feast in honor, 14-586
- Pompadour, Jeanne Antoinette Poisson le Nor-**  
**mant d'Etioles, Marquise de**  
 and Louis XV, 6-186  
 influence upon French art and furniture, 12-  
 190  
 painted by François Boucher, 11-283
- Pompeii**, ancient city, Italy, main article, 5-  
 †256-60  
 bakery, 9-\*241  
 destruction, 5-257, 238; 13-\*53  
 furniture, 12-\*178-79, 180  
 copied in Directoire style, 12-192  
 house in, 11-\*434  
 House of the Tragic Poet, 12-110  
 mosaics, 11-53, \*56  
 mural paintings, 11-†57, \*70  
 public baths, 5-\*239
- Pompey the Great** (Cneius Pompeius Magnus),  
 Roman general, 5-222, 223, 224  
 and Caesar, 12-357, 358  
 command at Rome, 5-224  
 defeat and death, 5-224  
 first triumvirate, 5-223  
 Jerusalem besieged by, 5-129  
 victories, 5-222
- Ponca Indians**, receive Oklahoma land grant, 8-  
 317

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Ponce de León, Juan**, quest for fountain of youth, 8-69
- Poncelet, Jean Victor**, 10-398
- Pond frog**, 3-\*416
- Pond lilies**, 2-\*199, †200
- Pond skater**, insect, 3-†404
- Pond turtle**, 3-474
- Pondicherry**, India, French trade settlement, 5-379, 382
- Ponds**, green scum on, 2-68
- Pondweeds**, 2-200
- Pongee**, silk, 9-44
- Ponies**  
     polo, 14-†525  
     Shetland, 4-\*350, \*508; 6-†486
- Pons**, anatomy, 2-\*385
- Pont-du-Gard**, Nîmes, France, 11-\*437, 438; 10-\*210
- Pontchartrain**, dog, 4-\*495
- Pontchartrain, Lake**, La., 8-146
- Ponte Margherita**, Rome, 6-\*315
- Ponte Vecchio**, Florence, 11-\*483
- Pontiac**, Indian chief, revolt, 7-\*10, 11; 8-182  
     English forts seized, 8-111
- Pontiac's Rebellion**, 7-\*10, 11; 8-336
- Ponting, Herbert G.**, Antarctic photographs, 4-\*210, \*216, \*218
- Pontius Pilate**, Jesus brought before, 5-†132
- Pontoon bridge**, 10-210
- Pontotoc Ridge**, Miss., 8-206
- Pontus**, Black Sea, first home of iron, 12-2
- Pony Express**, 12-574; 10-\*87, 88, †190
- Poodles**, dogs, 4-\*499, 503
- Pooh-pooh theory** of language, 10-2
- Pool**, life in, 3-\*222
- Poole, Ernest**, author, 13-347
- Poor**, care of  
     England, during Elizabeth's reign, 6-54  
     *see also* Social welfare work
- "Poor Fisherman, The,"** painting by Puvis de Chavannes, 11-\*342
- Poor Laws**, England, 6-95  
     Workhouse Test, 7-435
- "Poor Little Match Girl, The,"** by Hans Christian Andersen, 13-86
- "Poor People,"** by Dostoyevsky, 13-94
- Poor pussy**, game, 14-159
- "Poor Richard's Almanac,"** published by Benjamin Franklin, 12-464  
     shop where printed, 10-\*77
- "Poor White,"** by Sherwood Anderson, 13-350
- Pop corn**, 9-106
- Pop gun**, how to make, 14-†32
- Pope, Alexander, life and works**, main article, 13-†183-85  
     epigrams, 13-185  
     "Iliad" favorite of Sam Houston, 12-\*514  
     portrait, 13-\*184  
     satire, 13-179, 185
- Pope**, origin of name, 5-276; *see also* Papacy, and names of individual popes, as Innocent III
- Popham, George**, head of Maine colony, 8-151
- Popham Beach**, early colony, 8-151  
     shipbuilding, 8-153
- Poplar**, tree, 2-158, 159  
     bud, 2-133, 134  
     Greek myth about, 14-415  
     prehistoric period, 3-53  
     Spanish name, 8-380  
     use of wood, 9-258
- Poplar Grove**, Va., national cemetery, 8-418-A
- Poplar River**, U. S., 8-220  
     temperature of vicinity, 1-210
- Popliteal artery and vein**, anatomy, 2-\*396
- Popliteal nerves**, anatomy, 2-\*393
- Popocatepetl**, volcano, Mexico, 7-87-B  
     map, 7-597, E5
- Poppaea Sabina**, character: influence over Nero, 5-235
- Poppy**, plant  
     opium from, 9-217  
     seeds, 9-218, 2-\*124
- Poppy bee**, 3-302
- Popul Vuh**, Mayan chronicle, 7-44
- Population**, effect of climate upon, 1-195  
     increase during Industrial Revolution, 6-85  
     U. S. census records, 7-379
- Populist party**, U. S., 7-291, 292, 372
- Poquelin, Jean Baptiste**, *see* Molière
- Porcel, Isabel Corbo de**, portrait by Goya, 11-\*308
- Porcelain**  
     Chinese, 12-\*40 fol., 41, 42, †43, 44, \*57, 58  
     copied by Dutch, 12-58  
     compared with earthenware, 12-42  
     Dresden, 12-60  
     European, 12-\*40, †59-61  
     how made, 12-†43-46  
     soft-paste, 12-60  
     translucency, 12-42
- Porcelain crab**, 3-\*174
- Porcelain Pagoda**, Nanking, China, 11-394; 12-\*100
- Porch of the Maidens**, in Erechtheum, Athens, 11-\*424, 425
- Porcupine**, 4-†378, \*381  
     eaten by fisher marten, 4-357
- Porcupine anteater**, 4-†471, 472
- Porcupine lizard**, 3-457
- Porcupine Mountains**, Mich., 8-186-A
- Porcupine River**, Alaska, 8-16
- Pore of leaf**, 2-\*52
- Pore of skin**, clogging of, 2-293
- "Porgy,"** drama by Du Bose Heyward, 13-355
- "Porgy and Bess,"** opera by George Gershwin, 13-355
- Porpoise**, fish, 4-\*445, 448
- Porpoise hide**, 4-446, 448
- Porpoise oil**, 4-446
- Porpora, Niccolò Antonio**, 12-244  
     and Haydn, 12-274
- Porringer**, silver, 12-\*91
- Porsena, Lars**, Etruscan king, 5-\*200  
     advance upon Rome, 12-340
- Port**, of boat, 14-532

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Port Arthur**, Ontario, grain elevators, 7-<sup>\*</sup>26  
**Port-au-Prince**, Haiti, temperature, 7-54-A  
**Port authority**, 10-250  
**Port Inglis**, canal to Jacksonville, 8-224  
**Port Jackson**, Australia, settlement, 5-<sup>\*</sup>546, 548; *see also* Sydney  
**Port Natal** (Durban), South Africa, 5-482  
**Port Newark**, 8-249  
**Port of entry**, 10-246  
**Port of Spain**, Trinidad, 7-66, <sup>\*</sup>65  
**Port Radium**, Great Bear Lake, Canada, 7-<sup>\*</sup>29-X  
**Port Royal**, Jamaica, 7-54  
**Port Royal** (Annapolis), Nova Scotia, 7-29-M; 13-481  
**Port Said**, Egypt, coaling station, 10-237  
**Port wine**, 6-342-A  
**Portage teams**, Canada, 7-<sup>\*</sup>13  
**Portal**, Sir Charles, 6-<sup>\*</sup>548  
**Portal circulation** of blood, 2-374  
**Portal vein**, anatomy, 2-361, 374  
**Portative organ**, 12-<sup>\*</sup>225  
**Portcullis** of castle, 5-305; 11-457  
**Porter**, William Sydney (O. Henry), life and works, main article, 13-†341-43  
 portrait, 13-<sup>\*</sup>342  
**Porterhouse steak**, amount from steer, 9-328  
**Portes Gil**, Emilio, provisional president of Mexico, 7-87  
**Porthos**, character in "The Three Musketeers," 13-128  
**Portia**, Shakespearean character from "Merchant of Venice," played by male actor, 12-330  
**Portico**, in architecture, 11-418, 430, <sup>\*</sup>431  
**Portinari**, Beatrice, friend of Dante, 6-<sup>\*</sup>299; 13-†59  
**Portland**, Maine, 8-154  
 formerly Falmouth, 8-152  
 temperature, 8-156  
**Portland**, Oregon, 8-†325, 330  
 a quay port, 10-246  
 meteorite near, 1-<sup>\*</sup>161  
 rainfall and temperature, 8-331  
**Portland brownstone**, or freestone, Connecticut's production, 8-59  
**Portland cement**, manufacture, 9-<sup>\*</sup>383; 10-545  
 factory, 9-<sup>\*</sup>383  
 New Jersey industry, 8-249  
**Portland vase**, 12-†29, 31, 107  
**Porto Bello**, Panama, gaiety in Spanish days, description, 5-501  
**Porto Rico**, island, description and history, main article, 8-469-70; 7-58; general data, 7-60  
 acquired by United States, 7-297  
 agriculture, 7-60  
 American rule, 7-298  
 area, 7-60  
 climate, 7-60  
 government, 7-60  
 location, 7-60  
 map, 8-563  
 people, 7-60  
 physical features, 7-60

**Porto Rico**—*continued*  
 products and industries, 7-59, 60; 8-470  
 pineapple culture, 2-219  
 school children, 7-<sup>\*</sup>57  
**Portoferraio**, harbor of Elba, Italy, 6-474  
**Portrait mask**, from Mycenae, 11-<sup>\*</sup>34  
**"Portrait of a Lady,"** by Henry James, 13-336  
**"Portrait of an Unknown Roman,"** sculpture, 11-69  
**"Portrait of a Young Woman,"** painting by Albrecht Dürer, 11-<sup>\*</sup>209  
**Portrait painters**  
 Anthony Van Dyck, 11-228  
 Durer and Holbein, 11-†207-14  
 Raphael, 11-†168  
 Rembrandt van Ryn, 11-<sup>\*</sup>271, 272  
 Sir Joshua Reynolds, 13-<sup>\*</sup>194, 195; 11-†294 fol., 302  
 Titian, 11-<sup>\*</sup>177, 178, <sup>\*</sup>180  
*see also* Stuart, Gilbert, and other painters  
**Portraits**  
 ancient panel-portraits and masks, 11-20  
 enameled, 12-<sup>\*</sup>67, 68  
 painting  
 American, 11-<sup>\*</sup>355, 356  
 Dutch, 11-†261 fol., <sup>\*</sup>272, <sup>\*</sup>275  
 English, 11-†294-304, 318  
 first painted in an outdoor light, 11-257  
 Greek, 11-53, 58  
 Roman, 11-69  
 Spanish, 11-<sup>\*</sup>243, †247-58  
 sculpture  
 Etruscan, 11-<sup>\*</sup>62  
 Gothic, 11-98, 103  
 Roman, 5-247; 11-<sup>\*</sup>60, 62, 69-  
**Ports**, famous, 10-253  
 tonnage of vessels entering chief ports, 10-240  
*see also* Docks and harbors  
**Portsmouth**, N. H.  
 formerly Strawberry Banke, 8-237  
 Russo-Japanese peace conference, 7-307  
**Portsmouth**, Va., consolidated with other ports, 8-415  
**Portsmouth Navy Yard**, 8-154  
**Portugal**, country, Europe, description and history, main article, 6-†337-42; general data, 6-342-A; *see also* Index World War II, 6-493  
 agriculture, 6-337, <sup>\*</sup>339, 342-A  
 area, 6-342-A  
 climate, 6-337, 342-A  
 explorations, 6-340  
 African coast, 5-460, 464, 468, 476; 7-113, 119; 13-456, 460  
 American coast, 7-119  
 discovery of route to India, 7-113, 119; 13-460  
 voyages to Japan, 5-354, 357  
 explorers immortalized in verse of Camoëns, 13-81  
 flag, color plate, 14-following 570, no. 56

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Portugal—continued**

- furniture, 12-<sup>\*</sup>187
- government, 6-342-A
- history, 6-†337-42
  - rule in South America, 5-496, 500, 501, 507
  - Brazil made center of empire, 5-507
  - Spanish rule, 6-338, 341
  - Moors driven out, 6-338
  - becomes independent kingdom, 6-340
  - Inquisition; banishment of Jews, 6-341
  - Peninsular War, 6-342
  - republic established; revolutions, 6-342
- literature; Camoëns, 13-80-81
- location, 6-342-A
- maps, 6-591, 570
- peoples; emigration, 6-342-A, 337, <sup>\*</sup>339
- physical features, 6-342-A, 337
- possessions
  - Africa, 5-473 B
    - map showing, 5-<sup>\*</sup>444
  - Asiatic, list, 5-336-D
  - Azores Islands, 6-489
  - Cape Verde Islands, 6-491
  - Madeira Islands, 6-490
  - Pacific Islands, 5-522
- products, 6-342-A
  - cork, 9-496
- racial ancestry, 6-337
- Renaissance, 13-81
- sea power, 10-169
- seafaring nation; exports, 6-337
- trade, 6-<sup>\*</sup>337
  - China and Japan, 5-354, 356
  - early, 6-341, 342
  - India, 5-378, 379
  - Malay Peninsula, 5-426
  - merchant marine, number, 10-232
- Portuguese East Africa** (Mozambique), colony, map, 5-577
- Portuguese Guinea**, see Guinea, region, W. Africa
- Portuguese guitar**, 12-258-F
- Portuguese Literature**, Camoëns, 13-80-81
- Portuguese man-of-war**, hydroid (jelly fish) colony, 3-109, †110, †112
- Porus**, king of India, conquered by Alexander the Great, 5-<sup>\*</sup>179; 12-3
- Poseidon** (Neptune), god, 14-†407; 1-158, <sup>\*</sup>159 and Amphitrite, 14-435
  - contest with Athena, 5-<sup>\*</sup>152; 11-†420 fol.
  - in "The Odyssey," 13-30
  - kingdom of, 14-435-36
- Posen**, Poland, average temperature, 6-454-B
- Posey Tube**, San Francisco, 10-<sup>\*</sup>205, 207
- Positive and negative numbers**, algebra, 10-434
- Positive and negative electric charges**, 1-542
- Positive organ**, 12-223
- Positron**, electric particle, 1-558-II
- "Possessed, The,"** by Dostoyevsky, 13-95
- Post, Wiley**, aviator, portrait, 10-<sup>\*</sup>327
- "Post,"** derivation, meanings, and compounds, 10-13-14
- Post-glacial period**, 1-<sup>\*</sup>40

**Post impressionism in art**, 11-380

- Post Office Department**, U. S., 10-84, †89-92; 7-378
  - use of pneumatic tubes, 7-400
- "Post Office Stones,"** Cape of Good Hope, early post-offices, 10-85
- Post riders**, see Couriers
- Postage stamp**, first used, 10-87, 90
- Postal notes**, 10-91
- Postal money orders**, 10-91
- Postal savings stamp**, 7-529
- Postal Savings Division of Post Office**, 7-378
- Postal savings system**, created by Taft, 12-456-E
- Postal service**, main article, 10-†84-92
  - ancient times, 10-†85; Assyrian, 5-92
  - early American and United States, 10-84, †87-92
    - air mail service, 7-378, 10-91, <sup>\*</sup>92
    - classes of mail, 10-92
    - misdirected mail and Dead Letter Office, 10-84, †90-91
    - pneumatic tubes, 7-400
    - Pony Express, 10-<sup>\*</sup>87, 88
    - Post Office Department's work, 10-†89
    - postmen, 7-<sup>\*</sup>376; 10-<sup>\*</sup>90
    - rates, 10-90
    - registered and special delivery, 10-91-92
    - Rural Free Delivery, 10-91
  - English, 10-†86
  - pneumatic tubes, 7-400
  - Roman, 5-242
  - V. Mail Service, 10-92
- Postern gates**, 5-<sup>\*</sup>304
- "Postman Roulin, The,"** painting by Van Gogh, 11-2nd color plate following 360
- Postmaster-general**, Franklin the first, 10-88
- Postmen**, 7-<sup>\*</sup>376
- Posture**
  - importance of, 2-414
  - standing straight, test, 2-†415
  - swimming positions, 14-535
- Pot metal**, molten glass, 12-30
- "Pot of Basil, The,"** by John Keats, scene from, 13-<sup>\*</sup>230
- Potash**, 1-97; 10-546
  - enamel manufacture, 12-63
  - glass manufacture, 12-26, 29
  - mines, 1-97; 5-457
- Potash fertilizers**, 7-455
- Potassium**, element
  - chemical behavior, 1-547
  - isolated by Davy, 13-385
  - necessary to plants, 10-545
  - symbol, atomic no. and wt., 1-<sup>\*</sup>551
- Potassium salts**
  - effect upon muscles, 2-377
  - European deposits, 6-162-D
- Potato blight**, 2-136, <sup>\*</sup>137, †138
- Potato bug**, 3-338, <sup>\*</sup>339
- Potato plant**
  - blight, 2-136, <sup>\*</sup>137, †138

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Potato plant**—*continued*

stem, 2-\*31, 32

tomato grafted on, 2-\*262

**Potato race, game, 14-168****Potato worm, 3-290****Potatoes, main article, 9-†142-45**

buds ("eyes"), 2-32

Burbank's varieties, 13-417

growing centers, 9-\*142, 143, \*145; 8-197

Idaho, 8-\*89, 91; 7-\*460

how grown, 9-145

introduced into Europe, 9-143, 2-136

Ireland's dependence upon, 2-136

"Spud Island," Prince Edward Island, 7-29-M

substances made from, 9-144

water content, 2-259

*see also* Sweet potato**Potawatomi Indians**

Illinois, 8-98

Oklahoma land grant, 8-317

Wisconsin, 8-440

**Potemkin, Grigori Aleksandrovich, Prince, 6-433****Potential energy, 1-338, 339****Poterat, Louis, makes soft-paste porcelain, 12-59****Potholes in rocks, 1-62****Potlatch, Idaho, sawmill, 8-92****Potomac, Army of the, 7-260, 262, 263****Potomac Indians, 8-412****Potomac River, U. S., 8-418**

estuary, 8-410

fisheries, 9-368

map, 7-595

Maryland, 8-162-A

West Virginia, 8-436-A

**Pots, baskets used as, 12-131****Potsdam Conference, 6-557****Pottawattamie Indians, *see* Potawatomi****Potten kant (pot lace), 12-170****Potter, Humphrey, 10-398****Potter, Paul, Dutch painter, 11-265**

"Young Bull," painting, 11-\*265

**Potter's wheel, 12-†43****Pottery, main article, 12-†40-61**

arabesque, 12-56

art of decorating, 12-†46

basketry as protection for, 12-130

Cyprus, 12-\*50

earthenware, 12-†42-58

glaze, 12-42, 46, 54, 55

history, 12-47

how amateurs can make, 14-†57

how made, 12-42, †43-46

importance to archaeologist, 5-\*6, 7

modern industry, 12-43-45, \*60, 61

Indiana, 8-114

New Jersey, 8-247

Ohio, 8-311

porcelain, 12-†43-46, 60

Chinese, 12-41, 42, †57 fol.; 5-330

European, 12-\*40, †59-61

restoration of ancient vases, 12-\*56

**Pottery**—*continued*

Rhodes, 12-\*49

sculptors' use of, 12-\*60

styles

African, 12-\*41; 5-\*472

American, 12-61

American Indian, 12-†47, 130; 5-\*495; 7-†90; 8-260

Austrian, 12-60

Bohemian, 12-\*40

Carthaginian, 12-\*42

Chinese, 12-\*40 fol., 41, 42, †43, 44, \*57, 58  
copied by Dutch, 12-58

Cretan and Greek, 12-†47-54; 5-†144 fol., \*158, 194

contribution to pottery, 12-54

division of labor, 12-46

red-figured and black-figured ware, 12-\*49, 53

story of first potter, 12-42

Dutch, 12-\*40, 58

Egyptian, 12-41, 43, †44, †51, \*53, 54-55

contribution to pottery, 12-54

ideas absorbed by Cretans, 12-48

English, 12-\*40, 61

Etruscan, 12-†52, 54; 5-†190, †191

French, 12-54, 58, 59, 61

German, 12-†40, 42, \*46, 60

Italian, 12-56

Japanese, 12-\*57

Mexican, 12-\*47; 7-\*70, 74

Mohammedan, 12-56

Mycenaean, 12-\*48

Roman, 12-\*52

Royal Copenhagen, 12-\*60

Siamese, 12-\*40

Spanish, 12-56

Sumerian, 5-\*77

Swiss, 12-\*58

Turkish, 12-56

**Pouch, of fish, 3-215****Pouched animals, *see* Marsupials****Poughkeepsie, N. Y., boat races, 14-533****Poultry, main article, 9-†350-59**

industry of Vineland, N. J., 8-245

**Pound, Ezra, poet, 13-347, 349****Pound, British money, 9-390****Pound, measure, 10-373****Pourgold, Nadejda, wife of Nikolai Rimsky-Korsakov, 12-313****Poussin, Nicholas, life and art, 11-†234, 235-37, 238**

"Angel Dictating the Gospels to St. Matthew, The," painting, 11-\*234

art style compared with David's, 11-289

contemporaries, 12-412

**Poverty Bay, New Zealand, discovery, 5-532****Povoa de Varzim, Portugal, fisher folk, 6-\*340****Powder-down feathers, 4-13****Powder River, U. S.**

Montana, 8-220

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Powder River—continued**

- Oregon, 8-331
- Wyoming, 8-454
- Power**, 1-502, †506-11; 7-499
  - chemist's developments, 10-549
  - compressed air, 1-†462 fol.
  - economic importance, 7-499
  - electric, *see* Electric power
  - fuels, 1-506, 508
  - machines, simple; principles**, 1-†323-31
  - power houses, *see* Power houses
  - sold to public; purposes, 1-527
  - steam, 10-†395-401; 1-506
  - tides, 9-442
  - TVA project, 8-371-72, 368
  - units of measurement, 1-509; 10-397
  - uses, 1-506
  - water, *see* Water power
  - wind, 1-†508
  - work energy, 1-†333-41
  - see also* Energy; Force
- Power drill** in mining, 9-419
- Power house**
  - electrical, 1-303, 339, 506, 507, 508, 510; 7-542
  - Edison's first, model of, 1-506
  - toy, how to build, 14-†37
- Power stroke** of automobile, 10-†282
- Powers, Hiram**, statue by, 11-375
- Powhatan**, Indian chief, 7-122
  - and John Smith, 12-458, 459
- Powhatan Confederacy**, 8-412
- Poynings, Sir John**, viceroy of Ireland, 6-152
- Poynings' Law**, 6-152, 156
- Prado**, museum, Madrid, collection of pictures, 11-309
- "Praeterita,"** by John Ruskin, 13-236
- Praetorian (Imperial) Guard**, Rome, 5-235
- Praetors**, Roman, 5-201
- Pragmatic Sanction**, 6-264, 284
- Prague, Czechoslovakia**
  - buildings, 6-357, 359
  - clock, 10-465
  - government moved to, 6-360
  - library established, 10-556
  - location, 6-290-A
  - rainfall, 6-290-A
- Prairie**, *see* Prairies
- "Prairie, The,"** by James Fenimore Cooper, 13-297
- Prairie chicken**, 4-95, 97
- Prairie dog**, 4-†370-71
  - snakes in burrows of, 3-492
- Prairie dove** (gull), 4-203
- Prairie du Chien**
  - railroad built to, 8-443
  - trading posts, 8-440
  - junction of Wisconsin and Mississippi rivers, 8-439
- Prairie fire**, preventing spread of, 1-385
- "Prairie Folk,"** by Hamlin Garland, 13-346
- Prairie hare**, 4-386, 388

- Prairie horned lark**, bird, 4-233, 224
- Prairie pigeon** (gull), 4-203
- Prairie Plains**, North America, 7-33-M, 343-C
  - states lying in region of, 8-228
  - Texas, 8-386
  - South Dakota, 8-358
- Prairie Provinces**, Canada, 7-29-T-U, 33-A, 33-B
- Prairie rose**, North Dakota's state flower, 8-302-A
- Prairie schooners**, *see* Wagons, covered
- Prairie State**, nickname for Illinois, 8-106-A
- Prairie warbler**, 4-57, 55
- Prairie winds**, 1-230
- Prairie wolf** (coyote), 4-298, 301
- Prairies**, Western, 8-219
  - buffalo disappears, 7-468
  - in days of westward migrations, 7-233
  - Iowa, 8-120
  - Louisiana, 8-146
  - Missouri, 8-207
  - Texas, 8-377
  - transformed into farms, 7-280
  - vegetation, 2-197
  - wheat growing, Canada, 7-29-T
- "Praise of Folly, The,"** by Erasmus, 13-83
- Praseodymium**, element, symbol, atomic no. and wt., 1-551
- Pratt, Edwin J.**, Canadian poet, biography, 13-581; 7-29-I
- "Pravda,"** Russian newspaper, 12-449-F
- Prawns**, crustaceans, 3-187-89; prehistoric, 3-9
- Praxiteles**, Greek sculptor, 11-50, 52
  - Aphrodite of Cnidus, 11-51, 52
  - contemporaries, 5-176
  - Cupid, 14-411; 11-52
  - Hermes, 11-450, 52
- Prayer**, in life of Mohammedans, 5-†416 fol.
- Prayer book**, first English, 6-48
- Prayer rugs**, 12-148, 149; 5-†417
- Praying mantis**, insect, 3-351, 355
- Pre-Cambrian (Canadian) Shield**, 7-29-K
- Pre-Raphaelite Brotherhood**, 11-316-18, 319
- Pre-Raphaelite Movement**, 13-256
- Preaching friars**, 5-277
- Precedent**, legal, 7-386
- Precession of the equinoxes**, 1-180
- Precious stones**, main article, 9-†428-33
  - color plate, 9-frontispiece
  - Montana, 8-218
  - why considered precious, 12-118
  - see also* Gems; Jewelry
- Precipitation**, 1-†244-56
  - dew, 1-†240, 241
  - fog, 1-237, 241-42, 407
  - frost, 1-237, 240, 251
  - hail, 1-249
  - meaning, 1-254
  - rain, 1-†244-46, 254-56
  - snow, 1-†251-54
- Predestination**, 13-292, 557
- Prefabricated houses**, 9-387-A; 6-561

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Prehistoric animals**, main article, 3-†1-58 (*see also* Contents Volume 3 for chapter headings)
- amphibians, 3-29, 39, 64
  - birds, 3-†43, 51, 52; 4-205, 210, 232
  - carnivores, 3-52, 54
  - centipedes, 3-18
  - Cuvier's studies, 13-424
  - dinosaurs, 3-\*37-39, †40, 48, †433-34; 5-437
  - Eolhippus, horse, 4-505, \*507
  - Gobi Desert, 5-437
  - herbivores, 3-56
  - insects, 3-18, 29, 39, 53, 64
    - fossilized in amber, 3-\*18, 53
  - mammals, 3-44, †47 fol.; 4-456
  - migration, 3-61
  - preserved in national monument, 7-421
  - reptiles
    - disappearance, 3-47, 48, 49
    - first appearance in Permian period, 3-†32-35, \*38, 64
  - Mesozoic era**, 3-†37-44, 56
  - restoration, 3-\*40; 13-424
  - sea creatures, 3-33
    - Cambrian period, 3-9, 10
    - Carboniferous period, 3-30
    - crustaceans, 3-10, 18, 24
    - Devonian period, 3-9, \*14, 21 fol.
    - mollusks, 3-9, 15, 18, 24, 64
    - Ordovician period, 3-12 fol.
    - Silurian period, 3-10, 18, 19
  - spiders, 3-29
  - tortoise, 3-\*467
  - woolly mammoths, 5-\*26
  - see also* Fossils; Geology
- Prehistoric periods**, main article, 3-†1-58
- animals, *see* Prehistoric animals
  - art, 11-†1-4; 5-27, †30 fol.; 6-317
    - cave carvings, 12-95, \*106; 5-\*6, 7; 4-†510
  - climate
    - before there were storms, 1-196
    - Devonian period, 3-22
    - Eocene period, 3-51
    - Old Stone Age, 5-26, 27, 28, 33; 11-2
    - Pliocene period, 3-57
  - geologic divisions, 3-6
    - tables, 1-40; 3-64
  - see also in index names of epochs, eras, and periods listed in above tables, as* Glacial epoch; Paleozoic era; Permian period
  - man, *see* Man, prehistoric
  - topography, 3-10, 15, 22, 57, 61; 5-26
    - Alaska, 8-16-A
    - Lake Bonneville, 8-390, 391
  - vegetation
    - artist's conception, 2-\*1; 9-†436
    - Cenozoic era, 3-49, 51, 53, 61
    - earliest, 3-6
    - fossilized, 3-\*5, \*29; 2-\*2
    - Mesozoic era, 3-39
    - Paleozoic era, 3-14, 18, †22, 23, \*26, †29
  - see also* Fossils
- "Prelude, The,"** by William Wordsworth, 13-214, 216
- Premier**, British, origin; duties, 6-78; 7-358
- residence, 6-\*106
- Premier**, French, 6-202-B
- Premolars**, teeth, 2-\*314
- "Preparing of the New Silk,"** painting by Hui Tsung, 5-\*326
- Presbyter**, in early Christian church, 5-275
- meaning of word, 6-124
- Presbyterianism**
- and English Civil Wars, 6-63, 66, 68
  - attempts to establish in England, 6-127
  - founded by Calvin, 13-547
  - Ireland, 6-156
  - Scotland, 6-124
- Prescott, William**, at Bunker Hill, 7-164
- "Present Crisis, The,"** by James Russell Lowell, 13-313
- "Presentation in the Temple,"** painting by Rembrandt, 11-272
- "Presentation of the Virgin in the Temple,"** painting by Tintoretto, 11-186
- Preservation of food**, *see* Canning; Food, Refrigeration
- Presidential campaigns**, famous
- Bryan leads Populist and free-silver forces, 7-292
  - Harrison-Tyler campaign methods, 7-227, 228
  - Hayes-Tilden contest, 7-274
  - landslide to Franklin D. Roosevelt, in 1932, 7-341
  - Theodore Roosevelt runs on Progressive platform, 7-311
  - tie between Adams and Jackson, 7-222, 223
  - tie between Jefferson and Burr, 7-200
- Presidential Range**, N. H., peaks in, 8-242 A
- Presidents**, Mexico, longest term on record, 7-86
- Presidents**, United States, thumb nail sketches of, 12-456-B-456-G
- cabinet, 7-370
  - duties and powers, 7-358, 364, 373
  - flag, color plate, 14-facing \*571
  - how chosen, 7-365
  - only one to meet a reigning European sovereign, 12-\*551
  - wives of, famous as First Ladies, 12-†558 64
  - gowns worn by, 9-\*15
  - see also names of presidents, as* Adams, John; Jefferson, Thomas
- Presidium**, governmental body, Russia, 6-443-B
- Press, freedom of the**
- Alien and Sedition Acts, 7-199
  - guaranteed in Constitutional amendment, 7-368
  - Milton's "Areopagitica," 13-168
  - suppressed by Charles X of France, 6-198
  - suppressed by Fascists, 6-315
  - suppressed by Nazis, 6-241
- Pressburg, Treaty of**, 12-430
- Pressed glass**, 12-36

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Pressure**

- electric, 1-510, 516
- forces lava to surface, 1-75
- liquids and gases on solids, 1-†467-74
- mountain building and rock formation, 1-20, 51
- ocean, 1-67
- turns snow into ice, 1-59
- water, 1-†365 70

**Pressure cooker, 1-†404, 405****Prester John, legendary king, 5-460****Prestonpans, Battle of, 6-130****Pretanni, ancient name for Irish and Britons, 6-143****"Pretenders, The," by Henrik Ibsen, 13-87****Pretenders to English throne, 6-75**

Old Pretender, *see* James Francis Edward Stuart

Young pretender, *see* Charles Edward Stuart

**Pretoria**

made home of governor, 5-489

Transvaal, occupied by British, 5-488

**Pretorius, Marthinus Wessels, 5-481, 482****Prevailing westerlies, winds, 1-225, 255, 256****Priam, king of Troy, 13-29**

city of, exc. cited, 5-17

kneeling before Achilles, 13-\*113

**Pribilof Islands, Bering Sea, 8-16-A**

seal rockeries, 4-†327-30

sealing, 8-14

**Price, economics, 7-532**

and gold supply, 7-513

cotton price's effect on foreign exchange, 9-29

effect on sales, competition, 7-538

food; effect of war, 7-577

influence upon money value, 7-546

**Price fixing in ancient Rome, 5-252****Prickle-skinned sea animals, 3-135****Prickles, plant, a protection against animals, 2-†203, †206****• Prickly pear, cactus, 2-\*167, 204****"Pride and Prejudice," by Jane Austen, 13-208****Priene, Asia Minor, temple to Athena, 11-\*421****Priest-king, of ancient Sumer, 5-78****Priestesses, Greek, 5-\*148, 154, 14-†443****Priestley, Joseph, life, main article, 13-379**

discoveries

gas exchange of plants, 2-49

oxygen, 13-381

use of rubber for erasers, 9-261

portrait, 2-\*50

**Priests, early, practiced charms on the sick, 13-357, 358**

Egyptian; money wasted, 5-68

Indian snake, 7-96

prehistoric tribes, 5-32

**Primary, direct, 7-312****Primary colors, color plate, 1-434, 440****Primary-election law**

Kansas, 8-131

Montana, 8-220-A

Wisconsin, 8-445

**Primary rocks, 1-40, 41**

Primates, *see* Apes; Lemurs; Monkeys

**"Primavera," painting by Botticelli, 11-\*145, 147****Prime minister**

Athenian archons, 5-159

British, 6-78; 7-358

residence, 6-\*106

**Primitive Germanic, language, 10-5****Primitive man, *see* Man, primitive****Primo de Rivera, Miguel, 6-335, 568****Primogeniture, inheritance by, 6-218, 260****"Primrose," change in spelling of, 10-23****Primrose, evening, effect of sunlight on, 2-\*194****"Prince, The," by Machiavelli, 13-69, 70****"Prince Ahmed, Story of," fairy tale, text, 14-†251-53****Prince Albert National Park, Saskatchewan, 7-29-V****Prince Edward Island, prov., Canada, 7-\*20, †29-L-N, 33-A**

Confederation Chamber, 7-\*33-D

history, 7-12, 14, 19, 23, †33-D

liquor control, 7-29

map, 7-593

national park, 7-29-M

population, 7-33-A

resources and industries, 7-\*20, †29-L-N, 33-A

**Prince of Paris, game, 14-153****Prince of the Exile, Jewish leader, 5-134****Prince of Wales, Cape, longitude, 7-33 M****Prince of Wales Island, Canada, 10-\*456****"Prince of Wales," warship, 6-\*526****Princes, League of German, 6-223****"Princess in the Tower," painting, 6-\*30****"Princess, The," by Alfred Tennyson, 13-250****"Princess Amelia," boat of William Kieft, 8-266****"Princess and the Pea, The," by Hans Christian Andersen, 13-86****"Princess Ida," by Gilbert and Sullivan, 12-320****Princeton, Battle of, 7-169**

death of Mercer, painting by Trumbull, 11-\*354

**Princeton University, 8-251; founded, 8-245**

Russell Sage Tower, 8-\*245

Woodrow Wilson's reforms, 12-548

**"Principia," by Sir Isaac Newton, 13-400, 401****"Principles of Geology," by Lyell, 13-431****Printer's Ink, how made, 9-307**

oil used in manufacture, 10-546

**Printing, main article, 10-†47-71**

beginnings in America, 10-56

brings newspapers into being, 10-73, 74

censorship and taxation of, 10-56

chemist's services to, 10-549

color printing, 10-†59, color plate, †64

engraving, 10-62

etching, 10-64, †65

first book printed in America, 7-79

first movable type; wood blocks, 10-48, \*49

for the blind, 10-60, \*62

Gutenberg's achievements, 10-†48-50

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Printing—continued**

introduced into England, 10-†51-52, 54; 6-43  
 invention; early Chinese, 10-48; 5-326  
 language standardized by, 10-21  
 lithography, 10-†66  
 photo-engraving, 10-†67-71  
 modern machines; presses, 10-\*48 fol., 58,  
 †59, 77, †81  
 spread of, in Europe, 10-51  
 woodcuts, 10-65

**Printing presses, 10-77, †81**

cylinder press, 10-58, \*59  
 hand presses, 10-\*48 fol., 58  
 rotary press, 10-\*82  
 two-color press, 10-†59

**Priors' Loggia, Florence, 11-\*483**

**Priors' Palace, Florence, Leonardo makes sketch**  
 for painting in, 11-154

**Pripet Basin, Europe, 6-454-B**

**Pripet River, Poland, 10-261**  
 map, 6-601

**Prism, defined, 1-430**

in lighthouse lamps, 10-228  
 in spectroscope, 1-188, \*440, 441  
 rainbow caused by, 1-187  
 refraction of light, 1-†431-32  
 separates colors in light, 1-199, \*271, color  
 plate, 435, 438, 439

**Prisons, 7-443**

authors who wrote in, 13-58  
 Sing Sing, 7-\*387  
*see also subhead charities and correction under*  
*each state for list of state prisons*

**"Prison of Socrates," 5-\*178****Prison reform, work of Elizabeth Fry, 6-†85**

**"Prisoner of Chillon, The,"** by George Gordon,  
 Lord Byron, 13-\*226, †227

**Prisoners**

Athenian; allowed to see sacred plays, 12-325  
 Chinese, 5-\*329  
 punishment of Roman criminals, 7-349  
 treatment of, Civil War, 7-†261

**Prisoner's base, game, 14-166****Private ownership, economics, 7-549****Private wrongs, defined, 7-387****Privateers, the men and their ships, 10-†158****Privet, structure of leaf, 2-26****Prize Song, from "The Mastersingers," 12-251****Probate court, 8-332****Problems, algebra, 10-432, 434****Proboscis**

insects, 3-280, 290, \*291, 358  
 marine worm, 3-124  
 whelk, 3-147

**Process industries, 10-546****Procession Street, Babylon, 11-28**

enameled lion, 12-\*63

**Proclamation Line of 1763, U. S., 7-\*206****Proclamation of Neutrality, Washington's, 7-195****Proclamation of 1763, Canada, 7-11****Procne, mythological character, 14-453**

**Procris and Cephalus, mythological characters,**  
 14-434

**Procrustes, "the Stretcher," mythological char-**  
 acter, 14-447

**Proctor, Vt., marble quarrying, 8-403****Procyon, star, star maps:**

Jan. and Feb., 1-178-B  
 March and April, 1-178-D  
 May and June, 1-178-F  
 Nov. and Dec., 1-178-K

**Producer, economics, 7-570****Production, economics, 7-532**

collective farming, Russia, 6-440  
 division of labor, 7-497-98  
 income from, 7-537

Industrial Revolution, 6-84, 85

**Machine Age, 10-†528-37**

mass production, 7-566, 567, 574

ownership of factories and similar means of  
 production, 7-551

relation to consumption, 7-552-53

Soviet plans, 6-443

**Products, plant, *see* Contents Volume 9**

**"Professor, The,"** novel, by Charlotte Brontë,  
 13-248

**"Professor at the Breakfast Table, The,"** by  
 Oliver Wendell Holmes, 13-309

**"Professor's House, The,"** novel by Willa  
 Cather, 13-352

**Profile Mountain, N. H., 8-242-A****Profit, economics, 7-533, 537**

shared in coöperative societies, 7-553

**Profit motive, economics, 7-549, 552****Program music, 12-242, 316****Progressive art, game, 14-164****Progressive party, New Zealand, 5-540****Progressive Republicans, political party, 7-311,  
 320****Prohibition (liquor control)**

Canada, 7-29

United States, 7-†335

Maine first state to enact law, 8-156-A

**Prohibition amendment, 7-190****Prohibition party, 7-335, 341****Projector, moving-picture, 10-503, †505**

**"Projects, Essay on,"** by Daniel Defoe, 13-176

**Projects, *see* unit page preceding each unit**

**Prokofieff, Sergei, composer, 12-255****Proletarian novels, 13-355****Proletariat, the working class, 6-440; 7-549**

*see also* Labor

**Prometheus, story of, 14-421, 422; 13-33**

**"Prometheus Bound,"** by Aeschylus, 13-33

**"Prometheus Unbound"**

Aeschylus, 13-33

Percy Bysshe Shelley, 13-33, 229

**Promethium, element, symbol, atomic no. and  
 weight, 1-\*551****Prominences of sun, 1-116, 117****Promised Land, 5-118****Promissory note, 7-\*521**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Promontory**, Utah, meeting of transcontinental railways at, 10-194, \*196
- Pronghorn antelope**, 4-424
- Prop roots**, 2-38
- Propellers**  
airplane, 1-471; 10-317, \*328; L, 28-O, \*328-K  
flying, how to make, 14-†39  
screw, invented by John Ericsson, 13-440
- Property**, socialist's attitude toward, 7-549
- Property qualifications** for voting, *see* Suffrage
- Prophecies, weather**, main article, 1-†263-68
- "Prophet, The,"** opera by Meyerbeer, 12-253
- Prophets, Hebrew**, 5-125, 126
- Proprietary colonies**, America, 7-130
- Propylaea** to Acropolis, Athens, 11-\*419
- Proscription**, ordered by Roman leaders, 12-362
- Prosecuting attorney** of state, 7-388
- Proserpina**, queen of Hades, *see* Persephone
- Pross, Miss**, character by Charles Dickens, 2-304
- Protactinium**, element, symbol, atomic no. and weight, 1-\*551, 558-G
- Protective devices** of animals, 4-†395  
birds, 4-\*76, 103, 113, 117, 229, 232, 236  
crabs and their disguises, 3-84, †93, \*106, \*143, \*174, 178, 180, 182  
fishes, 2 \*137, 194, 198, \*200, 202 fol.; *see also* Fishes, protective coloring  
frogs, 3-424  
insects, 3-283, 292, 293, 337, †349-55, \*381, 398  
mammals  
change of coloring for winter, 4-305, \*354, \*355, 356, 386  
claws of anteater, 4-451  
coloring of Barbary sheep, 4-428  
boar's tusks, 4-433  
polar bears, 4-478  
sea creatures, 3-117  
sea worms, 3-124  
spiders, 3-411  
*see also* Scent production
- Protector General to the Indians** (Bishop Las Casas), 7-80
- Protectorate**, government of England, 6-70
- Proteins**  
blood contains, 2-345, 348  
chemical elements in, 2-41  
food for campers, 14-554  
meat contains, 9-317  
milk and cheese contain, 9-347  
peanuts contain, 9-198  
seeds contain, 2-129  
use by cells, 2-361, 362
- Proterozoic era** (Earlier Life), 3-6, 9; 1-40  
forms of life in, table, 3-64  
rock formation, 1-\*40
- Protestant Episcopal church**, 6-48
- Protestant Reformation**, *see* Protestantism; Reformation, Protestant
- Protestantism**  
Austria, 6-259, †261, 262  
England, 6-45; 12-395; 13-148  
Elizabeth's policy, 6-52
- Protestantism**, England—*continued*  
persecutions of Bloody Mary, 6-\*47  
prayer book, 6-48  
Europe, today, 6-162-D  
France, 6-\*174, \*175, †176-77, 186  
Edict of Nantes, 6-179  
revocation of, 6-184  
exiles, 6-\*182; 7-140  
Louis XIV's laws against, 12-413  
Richelieu destroys political power of, 6-180  
*see also* Huguenots  
Germany, 6-212, 213; 13-541-44  
Thirty Years' War, 6-181  
Hungary, 6-282  
Ireland, 6-154, 156, 158  
Netherlands, 6-\*347, \*350, 354  
North America, 7-33-N  
Scotland, 6-116, 121, 124-28  
Sweden, 12-402; 6-398  
Switzerland, 6-251  
Wales, 6-140  
*see also* Puritans; Reformation; and names of churches, as Methodist Episcopal church
- Proteus**, blind salamander, 3-†431
- Proteus**, sea god, 14-436
- Prothallus**, of fern, 2-88, †89
- Protis**, becomes king in Marseilles, 6-165
- Protococcus**, alga, 2-68
- Protocol of Peace**, Spanish-American War, 7-302
- Protons**, in atoms, 1-499, 541; 13-3
- Protophyta**, one-celled creatures, first appearance on earth, 3-64
- Protoplasm**, living substance, 2-21  
discovery of, 2-279  
essence of life, 2-7  
of skin, 2-287
- Protozoa**, simplest animals, 2-\*21  
first appearance on earth, 3-64
- Protractor**, instrument for measuring angles, 10-438, \*439
- Proudhon, Pierre Paul**, paintings, 11-\*286, 290  
"Portrait of the Empress Josephine," 11-\*286
- Provence**, old prov., France, Roman arched bridge, 11-61
- Providence**, R. I., founded, 7-126  
harbor, 8-346  
Statehouse, 8-343  
temperature, 8-347
- "Providence Plantations in the Narragansett Bay, The,"** 8-344
- Providence River**, arm of Narragansett Bay, 8-347
- Province of Maine**, 8-152
- "Province of Maryland, The,"** name given to Maryland, 8-158
- Province Wellesley**, Straits Settlements, 5-426
- Provincetown**, Mass., 8-166
- Provo**, Utah, industries, 8-395
- Proximity fuse**, 10-365
- "Prudence,"** by Luca della Robbia, 11-\*130
- Prud'homme, Fort**, 8-367

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- "Prue,"** wife of Richard Steele, 13-180  
**Prunes,** 9-166  
**Pruning,** 2-10  
**Prunus,** tree, 5-\*559  
*Prunus persica*, fruit, 8-66-A  
**Prussia,** state, Germany, main article, 6-†216-229  
     **history,** 6-†216-29  
         becomes kingdom, 6-219  
         wars with Louis XIV, 6-219  
         under Frederick the Great, 12-†118-19  
         becomes leader of German empire, 6-231;  
             12-447-49  
         Seven Years' War, 6-221  
         partitions of Poland, 6-222, 224, 451, 452,  
             454  
         relations with Austria, 6-220-22, 223, 226,  
             229  
         relations with Italy, 6-309  
         relations with Poland, 6-448, 452  
         conflicts with Lithuania, 6-459, \*461  
         wars with Denmark, 6-409, 416  
         Seven Weeks' War, 6-227, 229  
         subordination of Austria, 12-448-49  
         map, 6-582  
**Prussian Academy of Sciences,** 13-15  
**Przevalsky's horse,** 4-\*349  
**Psalm,** in Hebrew religious service, 12-204  
**Psalter,** musical instrument, 12-221  
**Psamtik I,** Egyptian king, 5-7  
**Pseudopodia,** biology, 2-21  
**Psyche,** Cupid and, Greek myth, 14-\*460, 461  
**Psyche moth,** 3-293  
**Psychiatrists,** in social work, 7-442  
**Psychological analysis,** method in writing, 13-346  
**Psychology**  
     influence on modern writers, 13-350, 351  
     teachings of Plato, 13-7  
**"Psychology,"** by Herbert Spencer, 13-25  
**Pykter,** Greek jar, 12-50  
**PT boat,** 10-\*348  
**Ptah,** Egyptian god, 5-\*54, 67  
**Ptarmigan,** bird, 4-229  
**Pteridosperms,** plants, in Devonian period, 3-22  
**Pterodactyl,** prehistoric animal, 3-\*41, 42  
**Ptolemaic astronomy,** 1-\*101, 102, 177; 5-462;  
     13-393  
     map, 1-\*101  
**Ptolemies,** kings of Egypt, 5-72  
     rule of, 5-180, 181  
**Ptolemy I (Soter),** king of Egypt, 5-180  
     Euclid's answer to, 13-\*373, 374  
     library established, 10-556  
**Ptolemy V,** king of Egypt  
     cartouche, 10-\*38  
     story of, on Rosetta Stone, 10-\*41  
**Ptolemy XII,** king of Egypt, war with Cleo-  
     patra, 12-360  
**Ptolemy (Claudius Ptolemaeus),** Greco-Egypt-  
     ian astronomer  
     Almagest, list of stars, 1-177  
     book of arithmetic, 10-423  
**Ptolemy—continued**  
     doctrine that earth is center of universe, 1-  
         \*101, 102; 13-393  
     map of the world, 5-544  
     Mountains of the Moon described by, 5-462  
**Ptyalin,** enzyme, 2-355, 356  
**Public baths,** Roman, 5-\*239, 248; 11-62, 438  
**Public buildings,** Washington, *see* Washington,  
     D. C.  
**Public health,** main article, 7-423, 443  
     food inspection  
         fruit, 9-170  
         meat, 9-328  
         milk, 9-\*337, 338  
     sewerage, 7-397, †398  
     street cleaning, 7-†400  
     **waterworks,** 10-†535-42; 7-\*396, 398  
**Public Health Service,** U. S., 7-423  
**Public libraries,** *see* Libraries  
**Public safety,** main article, 2-†423-48  
     electricity: precautions, 1-524; 2-430; 7-395,  
         397  
     fire department, 7-†394  
     **first-aid treatment for accidents,** 2-†399-412  
     lighting of streets, 7-397  
     police department, 7-†393  
     roads, 10-†160-56  
         state responsibility for, 7-\*388, †389  
     *see also* Public health  
**Public Safety, Committee of,** governs France,  
     6-194  
**Public schools,** U. S., 7-389, 400  
**Public service commissions,** in New York State,  
     8-284-A  
**"Public Speech,"** by MacLeish, 13-355  
**Public utilities,** 7-542, 543  
     problem of government or private ownership,  
         7-544  
**Public utilities commission,** Wisconsin, 8-445  
**Public welfare,** *see* Social welfare work  
**Public wrongs,** 7-387  
**"Public Occurrences,"** by Benjamin Harris,  
     10-74, †76  
**Puccini, Giacomo,** musician, 12-253  
     portrait, 12-\*253  
**Puddingstone rock,** 1-54  
**Puddling** in iron smelting, 9 403  
**Pudens,** Roman senator, 11-77  
**Puebla,** state, Mexico, map, 7-597  
**Pueblo, Colorado,** 8-51  
**Pueblo Indians,** 7-†92-97; 8-257, 258  
     costume, 8-\*259  
     modern, 8-260  
     ovens, 9-239  
     weaving, 10-\*343  
**Pueblos,** Indian cities, 7-92, †93-95; 9-\*386  
     laid out in plan, 7-\*447  
     national monuments preserve, 8-50, 262-A  
     New Mexico, 8-255, 257, \*258  
**Puerto Rico,** *see* Porto Rico  
**Puff adder,** 3-\*482, 490

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Puffball, fungus**, 2-†73-75  
spores ejected by, 2-∗211
- Puffer fish**, 3-†207, ∗212
- Puffin** (sea parrot), bird, 4-200, 204, ∗205, 208  
nest building and breeding, 4-208  
Oligocene period, 3-52
- Puget, Pierre**, sculpture by, 11-∗235, 239  
Milo of Crotona, sculpture, 11-∗235
- Puget Sound**, 8-428
- Pugmill**, for grinding and mixing, 9-376
- Pugs**, dogs, 4-∗501
- Puke State**, 8-212-B
- Pulaski, Casimir, Count**  
aids American Revolution, 12-455  
portrait, 12-∗455
- Pulaski County**, Virginia, pure-bred stock, 8-414
- Pulaski Legion**, 12-455
- Pulaski Skyway**, 8-∗250, 12-455
- Pulcinella**, comedy character, 12-329
- Pulleys, principle of; types**, 1-∗325, ∗326, †328-30
- Pullman, George**, builds sleeping cars, 10-196
- Pullman coaches**, 10-∗193, ∗195, 196
- Pullman Company**, strike of, 1894, 7-290
- Pulmonary arteries**, 2-∗371, 373, †374  
color plate, 2 frontispiece, ∗374
- Pulmonary veins**, 2-†374, ∗375  
color plates, 2-frontispiece, 374
- Pulmotor**, 2-338
- Pulp**, used in paper making, 9-276, 277, 293  
mill, 8-∗293
- Pulque**, Mexican liquor, 7-85
- Pulse**, relation to heart beat, 2-376
- Puma** (cougar), animal, 4-292, †293-94
- Pumping systems** for water, 10 537, 538, 541
- Pumpkin**, 2-∗118, 256
- "Pumpkin Head,"** statue by Donatello, 11-∗128, †129
- Pumpkin seed**, fish, 3-228
- Pumps**  
automobile oil, 10-288  
kinds, 1-†464-65  
suction, in heating system, 1-480  
water, 10-537
- Punch**, Pulcinella possibly ancestor of, 12-329
- Punic Wars**, between Rome and Carthage, 5-†210-17; 12-†353 55  
First Punic War, 5-211-13, 12-†352  
iron used by Romans, 12-4  
sea power of Romans, 10-164  
Second Punic War, 5-214 16, 12-353-55  
Spain becomes Roman province, 6-319  
Third Punic War, 5-216
- Punishment**  
heretics burned at stake, 6-48  
Roman criminals, 7-349
- Punjab**, province, India  
Afghan invasion, 5-379  
Arab invasion, 5-373
- Punt**, ancient kingdom, Africa, Egyptian expedition to, 5-63; 10-161
- Punt**, in football, 14-516, 517 ∗
- Punto in aria**, lace, 12-166
- "Pup" tent**, 14-∗557
- Pupa stage of insects**  
ant lion, 3-384  
ants, 3-∗322  
army worm, 3-374  
bees, 3-299, 313  
beetle, 3-∗343  
buffalo fly, 3-389  
butterfly, 3-∗278, 280, 281, ∗282, ∗358  
caddis fly, 3-393  
cicada, 3-†373  
diver beetle, 3-400  
gnat, 3-362  
house fly, 3-†358  
lacewing fly cocoon, 3-∗382  
ladybird, 3-∗335  
mosquito, 3-∗363  
moth, 3-∗270, ∗286, 288, ∗289  
tiger moth, 3-∗270
- Pupil of eye**, 2-∗296, 298, ∗299  
function, 1-436  
of cat, 4-484
- Pupin, Michael I.**, long-distance telephone made possible by, 10-113
- Puppets and puppet shows**  
"Orlando Furioso" in, 13-67
- Purcell, Henry**, 12-227
- Purchasing power, distribution of**, 7-567
- Purdue University**, at Lafayette, Ind., 8-115
- Pure Food Act**, Upton Sinclair's "The Jungle" responsible for, 13-347
- Pure Food Laws**, meat inspection, 9-328
- Puri**, India, temple of Jagannath, 12-∗103
- Puritan Nonconformists**, religious intolerance, 8-167
- Puritan State** (Massachusetts), 8-176-B
- Puritans**, 8-167-68  
attitude toward life, 6-70  
holidays, 14-583, 584, ∗587, 588  
music, 12-257  
costume, 9-∗14  
hats, 9-92  
England, 7-124  
alliance with Scotch Presbyterians, 6-127  
Church of England and, 6-62, 64  
Civil Wars, 6-66, 68; 12-406-9  
destroy palaces and furnishings, 12-188  
establish villages in New Jersey, 8-251  
form of government, 7-126  
furniture, 12-198  
Milton's aid to, 13-166, 168  
New England, 7-†125-29  
Colonial times, 7-∗146, ∗147, ∗149, ∗152  
Newark settled by, 8-246  
style of architecture, 11-499
- Purple**, color, color plate, 1-434; *see also* Purple dyes
- Purple City**, *see* Peiping
- Purple cow**, as seen by artists, 11-344

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

- Purple dyes**, Phœnician  
 Tyrian, 5-111; 10-162  
 how obtained, 9-305  
 worn by Romans, 9-12; 12-181
- Purple finch**, bird, 4-126  
 New Hampshire's state bird, 8-242-B
- Purple gallinule**, bird, 4-\*109
- Purple grackle**, bird, 4-\*90, 91  
 color plate, 4-\*25
- Purple martin**, bird, 4-†35
- Pursuit planes**, 10-\*368-C  
 indicated by "P" in number, 10-368-F
- Pus-forming bacteria**, 2-\*14
- Pus infection**, 2-350
- Push-button warfare**, 10-\*365
- Pushkin, Alexander Sergeievitch**, "La Guzla"  
 translated by, 13-131
- "Puss in Boots"**, fairy tale, text, 14-†188-90
- Puss moth**, 3-288, 294
- Pussy wants a corner**, game, 14-161
- Pussy willow**, catkins, 2-\*131, †158
- Putnam, C. S.**, song by, 8-404
- Putnam, Israel**, life, main article, 12-†494
- Putter**, golf club, 14-495
- Puvis de Chavannes, Pierre Cécile**, paintings  
 by, 11-†342  
 "Poor Fisherman, The," painting, 11-\*342
- Puzzle balls**, Chinese carvings, 12-98
- Puzzles**, 14-†96-116; answers, 14-117-21  
 see also Magic; Riddles; Tricks
- Pygmalion and Galatea**, mythology, 14-453
- Pylons**, Egyptian, 11-\*412, 413; 5-\*66
- Pyramid Lake**, Nevada, 8-234-A, 231
- Pyramid of the Moon**, Teotihuacan, Mexico, 7-68
- Pyramid of the Sun**, Teotihuacan, Mexico, 7-\*68, 68
- Pyramids**  
 Egyptian, 5-†52-55, 184; 11-\*7, 11, \*403  
 Great Pyramid of Khufu, 11-†409-11, \*10;  
 5-54, 185, \*186  
 how to measure, 13-2  
 Khafra, 11-\*10  
 mainly built of limestone, 1-51  
 plaster from, 5-50  
 Roman copy of, 11-\*437  
 Mayan, 7-90, \*92  
 Mexican, 7-†68, \*69, \*71
- Pyramids, Battle of the**, 12-426
- Pyramus and Thisbe**, mythological characters,  
 14-438
- Pyrene**, use in fire extinguishing, 1-385
- Pyrenees**, mountain chain, Europe, 1-29  
 maps, 6-591, 580
- Pyrope**, gem, color plate, 9-frontispiece
- Pyrreha and Deucalion**, mythological characters,  
 14-436
- Pyrhic victory**, origin of term, 5-207
- Pyrrihus**, king of Epirus, defender of Greek  
 cities in Italy, 5-205, 206
- Pyrus malus*, 8-30-B
- Pythagoras**, greatest of Greek scientists, 5-160  
 astronomical ideas, 1-169  
 made a religion out of numbers, 10-421  
 teachings of, 13-\*3, 4  
 thought earth round, 1-103
- Pytheas**, Greek navigator, voyages of, 13-494
- Pythia**, priestess, Delphic oracle who aided Oedipus, 14-444
- Pythons**, snakes, 3-\*489, †494, \*495, \*496, 500;  
 9-\*72
- Pyxis**, jewel box, 12-52



- Qanats**, artificial canals, 5-106
- Qatar**, British protectorate, 5-336-D
- Quadrirène**, galley, 10-163
- Quadruplex system**, telegraphy, 10-99
- Quaestors**, Roman, 5-201
- Quagga**, extinct animal, 5-475
- Quails**, birds, 4-78, 94, †143  
 color plate, 4-\*152
- Quaker State**, nickname for Pennsylvania, 8-342
- Quakers**, 7-153  
 hats, 9-92  
 ill treatment by Puritans, 8-167  
 Indiana, 8-113  
 New Jersey, 8-251  
 Pennsylvania settled by 8-333, 334, 336  
 Philadelphia, 12-462  
 William Penn's work, 12-461
- "Quakers"**, nickname for Pennsylvanians, 8-342
- "Quality Street"**, by Sir James Barrie, 13-268
- Quarantine**, of plants, to control diseases, 2-141
- Quarries and quarrying**, 9-379, \*381, \*382  
 granite, 8-\*151  
 Indiana, 8-\*112  
 marble, 8-\*5, \*48  
 Pennsylvania, 8-337  
 Vermont, 8-402  
 Virginia, 8-415
- Quarry**, strata of rocks, 3-2
- Quart**, unit of measure, 10-375
- Quarter-sawed logs**, 2-31
- Quarterback**, in football, 14-516
- Quartz**, mineral, 1-537  
 in sandstone, 1-95
- Quartz amethyst**, color plate, 9-frontispiece
- Quasimodo**, the hunchback of Notre Dame, 13-†126
- Quaternary period**, 3-†59-64; table, 1-40  
 forms of life in, table, 3-64
- Quatrefoil**, architecture, 11-\*463, \*474

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Quawk** (black crowned night heron), 4-108, \*100, \*102
- Quay ports**, 10-246
- Quebec**, city, Canada  
 Benedict Arnold's attack on, 12-486  
 cantilever bridge, 10-214  
 Cartier's visit to village on site of, 13-474  
 city government, 7-33-L  
 Continental army repelled at, 7-\*11, 12  
 founded by Champlain, 13-481; 7-136  
 meeting of first legislature, 7-14  
 settlement, 7-5  
 stone cottages, 7-\*29-C  
 "Street Scene, Quebec," color plate, 7-\*29-I  
 taken by British, 7-8, \*142, 143
- Quebec**, province, Canada, 7-29-C-R, \*8, \*12, \*14, \*29-A, 33-A; map, 7-593  
 history, 7-14, 15-18, 29-L; 13-570-72, 575-76  
 Ohio formerly part of, 8-307  
 territory added, 8-111, 97  
 laws, 7-33-I, 33-J  
 population and people, 7-33-B, 29-Q-R  
 resources and industry, 7-29-Q, 33-B; 9-124  
 Wisconsin once part of, 8-471
- Quebec Act**, 7-11, 14
- Quebec Conference**, 1943, 7-29-D
- Quebracho**, wood, 5-518-B
- Queen**, first great, 5-62; 10-161
- Queen**, chess piece, 14-487
- Queen Anne furniture**, 12-192  
 imitated by Goddard, 12-198
- Queen Anne style**, architecture, 11-512
- Queen Anne's lace**, plant, 2-168
- Queen Ann's War**, 8-58
- Queen ant**, 3-321, 322, 323
- Queen bee**, 3-310, 312, 315, 316-17
- Queen Charlotte Islands**, Pacific, map, 7-592
- "Queen Elizabeth"**, ocean liner, 10-\*295
- "Queen Elizabeth's Virginal Book"**, 12-222
- "Queen Mab,"** by Shelley, 13-229
- "Queen Mary,"** steamship, 10-\*217
- Queen of Kings**, title of Abyssinian ruler, 5-460
- Queen o' the May**, 14-\*583
- Queen State**, nickname for Maryland, 8-162-B
- Queen wasp**, 3-306
- Queen's College**, now Rutgers University, 8-251
- Queen's gambit**, chess play, 14-489
- Queen's ware**, china, 12-61
- Queensland**, state, Australia, 5-544, 554, 556, 558  
 Captain Cook takes possession for England, 5-547  
 map, 5-601
- Queiros**, Portuguese explorer, 5-552
- "Quentin Durward,"** by Sir Walter Scott, 13-222
- Quercia, Jacopo della**, carvings, 11-120, 125, 126  
 carving of sacrifice of Isaac, 11-\*124  
 sarcophagus with figure of Hilaria del Carretto, 11-\*126
- Quercus** (Oak), classification, 2-183, 184
- Querétaro**, state, Mexico, map, 7-597  
 Federal Palace, 7-\*87-A
- Quesada, Gonzalo Ximenez, de**, 5-500
- "Questioning of the Sphinx, The,"** by Elihu Vedder, 5-\*47
- Quetzal**, Central American bird, 7-45
- Quetzalcoatl** (Fair God), Aztec deity  
 legend, 7-69, 74, 91  
 temple, 7-\*69
- Quetzaltenango**, Guatemala, 7-45
- Quezon, Manuel**, president of Philippines, 5-569; 12-555-J
- "Qui Transtulit Sustinet,"** quotation from Latin version of Psalms, 8-62
- Quiché Indians**, 7-44
- Quicklime**, 9-384
- Quicksilver**, *see* Mercury, element
- Quill pens**, 10-\*35
- Quill worms**, 3-119
- Quillayute Needles Bird Refuge**, 8-128-A
- Quills**  
 flight feathers, 4-13  
 used for pens, 9-358
- Quilt**, how to make, 14-178
- Quincy, Josiah**, 7-218; 10-146
- Quinine**, medicinal plant, 9-217, \*219-B  
 source, 5-518-B
- Quinquereme**, galley, 10-163
- Quintana Roo**, state, Mexico, map, 7-597
- Quipu**, sign arrangement of Inca Indians, 5-495
- Quirigua**, Guatemala, Mayan pillars, 7-\*42  
 poultry raising, 9-359
- Quit rents**  
 Australia, 5-559  
 Maryland, 8-159
- Quito**, Ecuador, 5-518-F  
 length of day and night, 1-202  
 taken from Indians, 5-500
- Quixote, Don**, fictional character, 13-173-77
- "Quo Vadis,"** photoplay, 10-507
- "Quo Sursam Velo Videre,"** motto on Minnesota seal, 8-198-A



- R C A Building**, New York, 11-\*510; 1-\*241
- R. F. C.**, *see* Reconstruction Finance Corporation, 12-456-D
- R K O Building**, New York, 11-\*510
- Ra**, Egyptian deity, *see* Re

- Rabbi**, Jewish teacher, 5-133
- Rabbit bandicoot**, 4-\*464, 465
- Rabbit warrens**, 4-388
- Rabbits**, 4-384, 1386-88  
 distinguished from hares, 4-388

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

**Rabbits—continued**

- Easter, meaning of, 14-581  
 egg, stages of development in cell, 13-\*361  
 fur used in hat manufacture, 9-†89  
 muscles of thigh, 2-\*330  
 scale drawing, 14-\*64
- Rabelais, François, life and works**, main article, 13-105-6  
 portrait, 13-\*105
- Rabies**, *see* Hydrophobia
- Raccoon**, animal, 4-†323
- Raccoon dog**, 4-\*307
- Raccoon family**, animals belonging to, 4-†322-25
- Race, Cape**, location by Lat. and Long., 7-29-Z
- Race horses**, 4-\*511, \*512, 514
- Race track**, 4-\*512
- Races, sport**  
 automobile, Bonneville Salt Flats, 9-\*412  
 boat, 14-†530-33  
 games, 14-168  
 yacht, 14-†527-30
- Races of man, three divisions**, main article, 5-†42-45  
 Asia, 5-336-C  
 color, 5-†43  
 definition of term, 5-267  
 dispersion, 5-†39  
 effect of climate on, 1-193  
 locations  
   Africa, 5-445, 451, 453, 458, 462, 464, 472, 473  
   America (Indians), 7-89  
   Australia and Tasmania, 5-†544  
   Borneo (Dyaks), 5-\*425, \*427  
   Canary Islands, 6-491  
   Central Asia, 5-434, 435, 436  
   Europe, 5-267, 269, 270  
   Finland, 6-456  
   Greenland (Eskimos), 6-†482-84  
   Malay Peninsula, 5-28, 425, 427  
   Mediterranean islands, 6-472, 476, 477  
   New Zealand, 5-531  
   North America, 7-33-B  
   Pacific islands, 5-520, 521, 523, 528  
   South America, 5-500  
   West Indies, 7-60, †53-59, †62-66  
 mixing of, 5-44, 267, 500  
 Red Paint People, 8-148-49, 150
- Rachmaninoff, Sergei**, 12-255
- Racine, Jean, life; dramas**, main article, 13-112-13  
 contemporaries, 12-412  
 Corneille praised by, 13-109  
 costumes in dramas, 12-348
- Racine, Wisconsin, manufacturers**, 8-444
- Racket-tailed kingfisher**, 4-50
- Radar**, main article, 1-†566-68, 64, 10-121  
 antenna, 1-\*567
- Radetsky, Joseph Wenzel**, 6-\*308
- Radial nerves**, 2-\*393
- Radiation of heat**, 1-\*398, \*399
- Radiator, automobile**, 10-†286

**Radiator, steam**

- heat transmission by, 1-†398  
 heated by steam condensation, 1-407  
 valve, 1-\*479, 480
- Radical**, political meaning of, 7-335
- Radicle**, of plant, 3-126
- Radio**, main article, 10-†115-21-R  
 aids making of phonograph records, 10-\*499, 500  
 apparatus used for, 10-121-11, 21-R  
 broadcasting, *see* Broadcasting  
 Camden's industry, 8-247  
 ether theory, 1-418  
 first transatlantic message, 10-116  
 frequencies and wave-lengths, 10-115, 121-11, 21-R; 1-418  
 Marconi's wireless telegraphy, 10-115-16  
 messages transmitted from cave, 1-80  
 microphone, 10-118, 121-K  
 modulation, 10-121-1  
 Morse code, 10-116, \*118  
 pioneer scientists, 10-115  
 radiograms, 10-116  
 S O S, 10-120  
 signals to ships, 10-115, 229  
 stations, 10-113, \*115, 116, \*117, \*121-B  
 telephony by, 10-113, \*117  
   wireless telephony, 10-118  
 television, 10-†125  
 transmission and reception, 10-116  
 use at sea, 10-115, 116  
 use by Byrds' Antarctic expedition, 13-\*511, 512  
   wireless for detecting icebergs, 1-64
- Radio City**, New York, 11-\*510
- Radio City Music Hall**, New York, 11-\*510; 12-†330  
 plaques from, 12-\*324, \*326, \*327
- Radio compass**, 10-120
- Radio Corporation of America**, control room, 10-\*118  
 building, 11-\*510
- Radio waves**, 10-115, 121-11-21-R  
 length compared with light waves, 1-\*419  
 produced by Hertz, 1-418
- Radioactive elements**, 9-425
- Radiograms**, transoceanic service, 10-116
- Radiolaria**, one-celled animals, 3-†80, \*76, \*78, \*79; 10-\*487; 1-\*52  
 Ordovician period, 3-14
- Radiolarian ooze**, 1-52; 3-80
- Radiomarine Corporation of America**, communication with Graf Zeppelin, 10-118
- Radiometer**, 1-\*399
- Radish**, vegetable, 9-150
- Radisson, Pierre Esprit**, explorations, 7-4, 139; 13-560; in Minnesota, 8-191
- Radium**, main article, 9-†424-26  
 discovery, 1-283  
 disintegration, 1-541; 9-425  
 earth's age calculated by, 1-43  
 properties; importance of discovery, 1-283

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Radium**—*continued*

- refining, 9-426
- symbol, atomic no. and wt., 1-551
- uses, 9-426

**Radius of circle**, geometry, 10-438

**Radix of tongue**, 2-308

**Radon**, gaseous element, 9-426

- symbol, atomic no. and wt., 1-551

**Raeburn, Sir Henry**, English painter, 11-304

- "Portrait of Dr. Joseph Black," 11-303

**Raff, Joachim**, and Edward MacDowell, 12-321

**Raffetto, Bertha**, song by, 8-234-B

**Raffles, Sir Stanford**, discovers largest flower, 2-250

**Rafflesia**, largest known flower, 2-250

- Java, 5-524

**Raft ducks** (scaups), 4-119

**"Raft of the Medusa, The,"** painting by Géricault, 11-322

**Rafts**

- balsas, 10-136, 137
- coconut, 2-209
- skin, 5-94; 10-136

**Rag paper**, 9-276

**Rail, bird**, 4-102, \*103, 108, 175

**Railroad bridge**, 10-211

**"Railroad Gantry,"** painting by Charles Burchfield, 11-387

**Railroad tracks**

- conductors of sound, 1-446
- expansion in heat, 1-478
- first made with wrought iron, 9-403

**Railroad Valley Migratory Bird Refuge**, 8-234-B

**Railroads**, main article, 10-185-200

- air brakes, 1-461, 462; 10-196, 200

- Africa, 10-267

- Asiatic, 10-263, 264, 265

- Canada's transcontinental roads, 7-24, 28

- changes wrought by, 10-187, 200

- city, 7-399

- club car, 10-197

- competition and monopoly, 7-543

- dining coach, 10-197

- England's Liverpool-Manchester line, 10-181, 185-87

- England's opposition to, 10-186

- European class system, 10-189

- first in the world, 10-179

- for horse-drawn vehicles, 10-177

- hanging railways, 10-190

- horse power, 10-188

- live stock transportation, 9-326, \*327

- location, 7-447

- mail service, 7-378; 10-84, 89

- mines, 9-417

- modern improvements and inventions, 10-

- \*186, 194, \*195, \*197

- monorail cars used, 1-201

- Pullman coaches, 10-193, \*195, 196

- rails, 10-194; 9-406

- cutting mill, 9-398

**Railroads**—*continued*

- reason for curve embankment, 1-310

- refrigerator cars, 9-329; 10-518

- safety precautions, 2-431

- when crossing tracks, 2-445

- significance to modern civilization, 10-200

- switch, 10-187

- tank cars for milk, 9-337

- tracks, *see* Railroad tracks

- tunnels, 10-202-7

- United States, 10-268

- Colorado's system, 8-52

- earliest, 10-181-83, 188, 190-92, 194, 196; 8-100

- first accident in America, 10-183

- first transcontinental line, 10-190 *fol.*; 7-278

- Florida, 8-74

- government aid, 7-278, 279

- Idaho, 8-91

- Iowa, 8-121

- Louisiana, 8-144

- Michigan, 8-185

- Mississippi, 8-205

- Missouri, 8-212

- New York, 8-279; 10-198

- North Dakota, 8-300

- Ohio, 8-310

- Tennessee, 8-369

- Texas, 8-385

- Transportation Act extends government control, 7-332

- under control of Interstate Commerce Commission, 7-288

- union of workers, 7-562

- war administration, 7-324

- West Virginia, 8-434

- Wisconsin's control, 8-445

- value to meat industry, 8-309

- wheels, 10-187

- see also* Locomotives

**Rails**, railway, 10-194

**"Railway Pathfinder,"** nickname of Theodore P. Judah, 10-192

**Rain and rainfall**, main articles, 1-244 46, 254 56

- Africa, 5-443, 444

- Algiers, Algeria, 5-473-C

- Egypt, 5-73-B

- Morocco, 5-473-C

- Sahara Desert, 5-444

- Union of South Africa, 5-491-B

- amount and distribution of, 1-254-56

- amount and weight, 1-89

- arid and semi-arid lands, 7-455

- Athens, Greece, 6-368-B

- Australia, 5-560-I

- Batavia, Java (Dutch East Indies), 5-529-B

- Bogotá, Colombia, 5-518-E

- Bolivia, 5-518-D

- Brazil, 5-518-F

- British Isles, 6-108-B

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

**Rain and rainfall—continued**

Bucharest, Roumania, 6-368-A  
 Buenos Aires, Argentina, 5-518-G  
 Caracas, Venezuela, 5-518-E  
 cause, 1-\*244, 246, 407  
 Ceylon, 5-387-B  
 Chile, 5-518-H  
 China, 5-336-A  
 clouds, 1-236  
 Copenhagen, Denmark, 6-416-B  
 Costa Rica, 7-48-B  
 Czechoslovakia, 6-290-A  
 Dutch East Indies, 5-529-B  
 Ecuador, 5-518-F  
 effect on plants, 2-193 fol.  
   tropics, 2-196  
 first on earth, 1-11  
 gauges, 1-\*274, 276; how to make, 14-†48  
 Germany, 6-241-B  
 Helsingfors, Finland, 6-464-B  
 how a shower is caused, 1-218  
 Hungary, 6-290-B  
 India, 5-387-A  
 Indo-China, 5-430-B  
 Ireland, 6-162-B  
 Kauai's high record, 8-461  
 Kovno, Lithuania, 6-464-B  
 London, England, 6-108-B  
 made by seeding clouds, 1-\*245, \*247, \*249  
 Malay Peninsula, 5-430-A  
 Manila, Philippine Islands, 5-570  
 maps showing distribution, 1-\*255  
 measurement, 1-254  
 Montevideo, Uruguay, 5-518-G  
 New Zealand, 5-541-B  
 Persia, 5-106  
 Peru, 5-518-D  
 Philippine Islands, 5-570  
 plant and animal life determined by, 5-444  
 Porto Rico, 7-60  
 red, 1-232  
 relation to dust in air, 1-220, 377  
 Russia, 6-443-A  
 shape of rain drops, 1-360  
 Siam, 5-430-A  
 signs, 1-†263-68  
 Sofia, Bulgaria, 6-368-A  
 South America, 5-518-A  
 streams filled by, 1-48  
 Switzerland, 6-254-B  
 Tokyo, Japan, 5-364-B  
 Turkey, 5-414-B  
 United States, 1-89; *see also* subhead climate  
   under various states  
 Venezuela, 5-518-E  
 water vapor source of, 1-239  
 Yugoslavia, 6-290-A  
**Rain crow** (cuckoo), 4-†75  
**Rain forests**, 2-258  
**Rain gauges**, *see* Rain, gauges  
**Rain tree**, does not cause rain, 2-261

**Rainbow**, cause, 1-†271, color plate, 435, 438  
   as weather sign, 1-265  
   colors due to wave lengths, 1-419  
   in Greek mythology, 14-408, 413  
   produced with prism, 1-187  
**Rainbow Bridge National Monument**, Utah,  
   8-396-A  
**Rainbow darter**, fish, 3-227  
**Rainbow Division**, U. S. Army, 12-555-J  
**Rainbow fish**, 3-233  
**Rainbow shot**, billiards, 14-481  
**Rainbow trout**, 3-236, \*237, \*241  
**Raincoats**, 9-268, 269  
**Raindrops**, life history, 1-\*244, 246  
   cause of rainbow, 1-439  
   shape, 1-360  
   why they fall, 1-474  
**Rainier**, Mt., Washington, 7-407, \*408  
**Rainy Lake**, between U. S. and Canada, 8-198  
**Rainy River**, North America, 8-198  
**Raisin grapes**, 9-168  
   safeguarded by Weather Bureau, 1-278  
**Rajah silk**, 9-44  
**Rajahs**, ruling princes of India, 5-369  
**Rajputs**, members of ruling caste, power in  
   India, 5-372, 379  
**Rakoczy, Francis II**, king of Hungary, 6-284  
**Rakoczy, George II**, king of Transylvania, 6-282  
**Raleigh, Sir Walter, life and exploits**, main arti-  
   cle, 13-†478-80  
   colonization efforts, 13-480; 8-286  
   history of the world, 13-480  
   portrait, 13-\*479  
   Queen Elizabeth, 13-470, 12-394  
   Raleigh, N. C., named after, 8-286  
   search for El Dorado, 13-480  
   smoking introduced into England by, 9-222  
   Spenser and, 13-\*149, 150  
   story of Irish potato, 9-143  
   Tennessee granted to, 8-367  
**Raleigh, N. C.**, capital, 8-286, 294  
   capitol building, 8-\*286  
**Raleigh Tavern**, Williamsburg, Va., 7-412  
**Ram**, constellation, *see* Aries  
**Ram**, wild, 9-\*74  
**Ram jet**, 10-365  
**Ramadan**, Moslem month of fasting, 5-423  
**Ramayana**, Indian epic, 5-368  
**"Rambler, The,"** by Dr. Johnson, 13-193  
**Rambouillet**, France, château, 11-\*490  
**Rambouillet ram**, 9-\*77  
**Rameau, Jean Philippe**, 12-227  
**Rameses**, *see* Ramses  
**Ramillies**, Belgium, Battle of, 6-75  
**Rampart Range**, Colo., 8-52-A  
**Ram's horn**, snail, 3-259  
**Ramses** (Rameses), rulers of Egypt, 5-68  
**Ramses the Great**, king of Egypt, temple of  
   Karnak built by, 11-400, 412  
**Ramses II**, king of Egypt, reign, 5-†68  
   message to Hittite king, 5-115  
   war chariots, 10-144; 12-2

- Ranch**, cattle farm  
 irrigation, 10-531  
 ranch life, 9-†318, \*319  
 scene, Argentina, 5-\*505
- Randall, James Ryder**, composer of "My Mary-land," 8-162-B
- Randolph**, aids Robert Bruce, 6-115, 116
- Randolph, Edmund Jennings**, American statesman, 12-\*496
- Randolph, John**, attitude toward Henry Clay, 12-519
- Randolph-Macon College**, Lynchburg, Va., 8-417
- Rangeley Lakes**, Maine, camping, 8-155
- "Ranger,"** John Paul Jones's ship, 12-500, 501
- Ranger, forest**, 14-\*522, 567
- Rangers**, soldiers, 7-479-C
- Rani Sipri**, mosque, Ahmedabad, 5-\*380
- Rank**, indications in costume, 9-5, 52, 92; *see also* class distinction
- Rankin, Jeannette**, suffrage worker, 8-220
- "Rape of the Lock, The,"** by Pope, 13-185
- Rapeseed oil**, uses, 9-312
- Raphael (Raffaello Sanzio)**, life and art, main article, 11-†164 69  
 designs for carving, 12-107  
 designs for wood mosaics, 12-114  
 Michelangelo and, 11-166, 167  
 paintings  
   "Madonna of the Chair," 11-\*167  
   portrait of Pope Julius II, 11-\*168  
   "Sistine Madonna," 11-\*164  
 tapestry cartoons, 12-141, 142  
 Vatican frescoes, 11-167
- Raphael ware**, majolica, 12-58
- Rapid transit**, 10-198
- Rappahannock River**, Va., 8-418, 410
- Raquet-tailed kingfisher**, bird, color plate, 4- \*185
- Raritan River**, N. J., 8-252
- Raspberry**, 9-156, 158
- Rasputin, Grigoriy Efimovich**, 6-439
- "Rasselas,"** by Dr. Johnson, 13-195
- Rat**, *see* Rats
- Rat-tailed maggot**, 3-365
- Rat-tailed opossum**, 4-\*469
- Rat-tailed viper**, 3-480
- Ratisbonne, Battle of**, 12-\*426
- Rats**, 4-†378-83, \*385  
 charmed by Piper of Hameln, 14-230  
 distributed by ships, 4-383, \*384  
 studies of heredity in, 13-†414
- Rattan**, palm, 1-191; 2-253
- Rattan cane**, used in making baskets, 12-134
- Ratti, Achilles** (Pope Pius XI), 6-\*467
- Rattlesnake**, 3-†491, †492, \*493, 501  
 companion of prairie marmot, 4-168  
 design on flags of American colonies, 14-574  
 Hopi ceremony of, 7-96, \*97  
 month, 3-\*483  
 treatment for bite of, 2-408
- "Rattlesnake,"** Huxley's expedition in, 13-437
- Ravel, Maurice**, 12-253
- "Raven, The,"** by Edgar Allen Poe, 13-315
- Ravenna**, city, Italy  
 center of art and culture, 11-†79-81  
 church of St. Apollinare, carvings, 11-\*76  
 throne of archbishop, 12-†181
- Ravens**, birds, 4-\*223
- Rawlinson, Sir Henry**, Behistun rock inscription read by, 5-104
- Ray**, fish, 3-\*198, †200-1
- Ray cells**, of stem, 2-31
- Ray flowers**, 2-175
- Rayon, manufacture of**, main article, 9-†83-86  
 acetate, 10-553  
 machinery, 1-\*554
- Rays**, other than light, 10-492, 495; 1-419
- Rays of starfish**, 3-\*128, 129, \*133
- Razor-billed auk**, bird, 4-206, 207
- Razor-bills**, birds, 4-204
- Razor shell**, mollusk, 3-153
- RDX**, explosive, 10-418
- Re**, Egyptian sun god, 5-\*54, 55, 64
- Reaction time**, in driving, 2-435, 437
- Reactionary**, political meaning of, 7-335
- Read, A. C.**, flight across Atlantic, 10-320, \*322
- Read, Deborah** (Mrs. Benjamin Franklin), 12-463, 464
- Read, George**, 12-\*496
- Reading**, England, nursery school, 7-\*440
- "Reading from Homer, A,"** painting, by Alma-Tadema, 13-\*27
- "Ready in Soul and Resource,"** motto of South Carolina, 8-356-A
- Real estate boom**, Florida, 8-75
- Real estate developments**, 7-448
- Realism**  
 art  
   Dutch school of painting, 11-262  
   English movement, 11-318  
   Flemish school, 11-195, 196  
   French painting, 11-†322-23, 338  
 literature, meaning, 13-346  
   American literature, 13-346  
   William Dean Howells, 13-332  
 drama, 12-333  
 Emile Zola, 13-135  
 first realistic novel, 13-188  
 Guy de Maupassant, 13-134  
 music, 12-315, 316
- Reaper machines**, 10-†409-13
- Reason, Age of**, 6-185
- "Reason, Pure, Critique of,"** by Kant, 13-22
- Rebab**, musical instrument, 12-213, 222, \*226
- Rebec**, musical instrument, 12-\*213, \*222, 224, \*226
- "Rebecca, the Lady"** (Pocahontas), 7-122
- "Rebecca at the Well,"** statue by Chauncey B. Ives, 11-\*375
- Rebekah**, 10-537
- Recalde, Iñigo López de**, *see* Loyola, Ignatius de, Saint
- Recall**, government, 1-312
- "Recamier, Madame,"** portrait by David, 11-\*287, 290

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Recapitulation**, musical term, 12-236
- Reccared**, king in Spain, and Catholicism, 6-320
- Receiver, telephone**, 1-†518-20; 10-110, \*111
- Recent period, geology**, 3-59, 64
- Receptacle** of flower, apple blossom, 2-116
- "Recessional,"** by Kipling, 13-269
- Recessive traits**, 13-415
- Recife**, Brazil, *see* Pernambuco
- Recipes**  
     **beverages**, 14-88  
     **candy**, 14-83-86  
     **coffee**, 9-132  
     **soybeans**, 9-214-B
- Reciprocal trade treaties**, 7-341-B  
     South America, 5-518  
     U. S. and Canada, 7-27, 29
- Recitative**, in music, 12-223, 225, 250
- Reclamation**  
     dam on Pecos River, New Mexico, 8-\*256  
     dust bowl region, 8-363  
     marsh land in Louisiana, 8-146  
     Nebraska, 8-226  
     Shasta Dam, Calif., 7-\*469  
     *see also* Conservation of natural resources
- Reclamation, Bureau of**, 10-531; 7-460, 378
- Reconstruction Act**, U. S., 7-270
- Reconstruction Finance Corporation**, 7-340, 12-456-D  
     president, 12-456-F
- Reconstruction period**, U. S., main article, 7-†267-74  
     Arkansas, 8-28  
     Florida, 8-72  
     Ku Klux Klan, 8-370  
     Louisiana, 8-144  
     South Carolina, 8-354-55
- Records, phonograph**, 1-443; 10-498 fol.  
     material, used for, 2-258
- Recreational activities**, *see* Contents Volume 14  
     and *also* Nature study; Things to do; Things to make
- Rectangle**, geometric figure, 10-†439  
     area computed in algebraic form, 10-433
- Rectum**, passage of food through, 2-358
- Recurrent fever**, bacteria of, 2-\*14
- Red**, color, color plate, 1-434, †439  
     algae cause of, in water and snow, 2-15, 66  
     dyes and inks, 9-305, 306, 307, 447; 2-80; 12-157  
     wave length, 1-438
- Red and blue macaw**, bird, color plate, 4 \*185, 190
- "Red Army" of Russia**, 6-441
- "Red Badge of Courage, The,"** novel by Ambrose Bierce, 13-346
- Red bat**, 4-†273
- Red-beaked waxbill**, bird, 4-182
- Red-billed toucan**, bird, color plate, 4-\*185
- Red-breasted nuthatch**, bird, 4-\*125, 126  
     color plate, 4-\*89
- Red cedar**, uses for wood, 9-258
- Red chatterer**, bird, color plate, 4-\*184
- Red Cloud**, Indian chief, 8-360
- Red clover**, Vermont's state flower, 8-404
- Red corpuscles**, 2-†344-46
- Red Cross**, main article, 7-†425-31  
     dogs in war service of, 4-503  
     during World Wars, 7-\*425, \*427, †430  
     flag, 14-573  
     inspired by Florence Nightingale, 6-99  
     international organization; emblem, 7-428  
     junior organization, 7-431  
     nurses, 7-\*425, \*427-28; 10-\*126  
     organized by Henri Dunant, 7-†426-29  
     services in times of catastrophe, 7-\*426, 428
- Red crossbill**, bird, 4-†130
- Red deer** (wapiti), 4-405, \*407, 412
- Red Dragon of Wales**, flag, color plate, 14-tacing \*572
- Red-eyed vireo**, bird, 4-†60
- Red-faced spider monkey** (coaita), 4-262
- Red-figured pottery**, Greek, 12-\*49, 53; 11-36
- "Red flag law"** controlling steam vehicles, 10-278
- Red flamingo**, bird, 4-198
- Red fox**, 4-303
- Red Grotto**, Capri, 1-87
- Red Guards**, Communists, in Finland, 6-457
- Red-headed woodpecker**, bird, 4-\*66, \*70, 71  
     color plate, 4 \*89
- Red Horses**, nickname for Kentucky natives, 8-138-B
- Red House**, treasury of Egypt, 5-51
- Red howler monkey**, 4-\*264, 265
- Red Hugh O'Donnell**, *see* O'Donnell, Hugh (Red Hugh)
- "Red Laugh, The,"** by Leonid Andreyev, 13-97
- Red jungle fowl**, wild bird, 9-35†
- Red kangaroo**, 4-462
- Red Lake**, Minn., 8-198
- Red marrow**, *see* Bones
- Red men**, term for Indians of America, 7-89
- "Red metal,"** copper, 9-419
- Red monkey**, 4-254
- Red ocher**, found in graves of Red Paint People, 8-149
- Red Paint People**, 8-148-49
- Red race**, 5-†43; *see also* Indians, American
- "Red Riding-Hood,"** fairy tale, text, 14-†249-51
- Red River**, U. S. tributary of Mississippi, rises in Texas, 8-30-A, 146  
     point of entry into Mississippi, 8-141
- Red River colony**, Pembina, North Dakota, 8-193
- Red River of the North**, U. S. and Canada, 8-198, 298; 7-33-A  
     formation and direction, 8-190  
     length, 10-253  
     North Dakota, 8-302  
     rainfall, 8-302
- Red River (Song-Koi)**, in Southwestern China and Tonkin, 5-430-B  
     map, 5-588
- Red river hog**, 4-\*433
- Red River Settlement**, Manitoba, 7-24; 8-299
- Red Sandrock Hills**, Vt., 8-404

The asterisk (\*) refers to picture and its explanation only The obelisk (†) refers to illustrated text.

- Red Sea**, Africa and Asia  
 algae cause color of, 2-66  
 canal joining with Nile River, 10-270  
 climate along coasts, 5-473-A  
 maps, 5-578, 580  
 thought to have been river, 5-394
- Red-shafted flicker**, bird, 4-72  
 color plate, 4-\*89
- "Red shirts,"** Garibaldi's soldiers, 6-309
- "Red Shoes,"** by Hans Christian Andersen, 13-85
- Red-shouldered hawk**, bird, 4-155
- Red spruce**, tree, 2-\*267
- Red squirrel**, 4-366, 367
- Red-tailed hawk**, bird, 4-155, 156  
 beak, 4-\*11
- Red-winged blackbird**, 4-†45-46, 101  
 nest building and breeding, 4-45, 46
- Red-winged waxbill**, bird, 4-182
- Redbird** (cardinal), 4-133  
 Kentucky's state bird, 8-138-B
- "Redemption, The,"** by Gounod, 12-307
- Redfield, William C.**, portrait, 12-549
- Redheads**, ducks, color plate, 4-\*120
- Redheffer, Charles**, perpetual-motion machine  
 hoax, 1-\*315, 316
- Redi, Francesco**, experiments, 2-278; 13-371
- Redpoll**, bird, 4-126, 127
- "Reds,"** communists, fear of, in U. S., 7-334
- Redstart**, bird, 4-†47  
 color plate, 4-\*89  
 nest building and breeding, 4-47
- Redunca antelope**, 4-\*417
- Redwing**, bird, 4-\*4
- Redwoods**, trees, 2-\*269  
 growth depends on weather, 1-\*216  
 Muir Woods famous for, 7-420  
 nursery, 2-\*243
- Reed, Walter**, 2-†388
- Reed boats** (balsas), 5-\*499
- Reed instruments**, 12-258-A
- Reed warbler**, bird, 4-175
- Reedbuck**, antelope, 4-\*419
- Reef-building coral**, 3-†98, †99-101; 1-56
- Reef knot**, 14-\*555
- Reelfoot Lake**, Tenn. and Ky., 8-373  
 caused by earthquake, 1-81
- Reeves' pheasant**, bird, 4-\*189
- Refectory**, dining hall, 5-308
- Referendum**, in government, 7-312; 8-364
- Refining of minerals and metals**  
 coal; sifting, 9 443  
 copper, 9-\*417  
 gold, 9-393, 394, \*395  
 iron, 9-†400, 401, †402, †403, \*406-07  
 oil, 9-450, †452, 454  
 radium, 9-426  
 salt, 9-\*410  
 silver, 9-389
- Refining of sugar**, 9-114 fol.
- Reflection of light**, 1-†422 fol.
- "Reflections in the Water,"** by Debussy, 12-253
- Reflex action**, 2-393, 397, 285
- Reflex angle**, geometry, 10-438
- Reflex system**, 2-285
- Reforestation**, main article, 2-†240-47; 9-\*257  
 forest preserves, 7-467  
 government supervision of farmer's planting, 7-470  
 Maine, 8-153  
 Michigan, 8-184  
 Pennsylvania, 8-339  
 Theodore Roosevelt's policy, 7-309, 310  
 Wisconsin, 8-443
- Reform, War of the, Mexico**, 7-84
- Reform Bills**, English  
 1832, 6-94, 95, 99  
 benefits Scotland, 6-132  
 1867, 6-100; 12-443  
 1884, 12-443
- Reform party**, New Zealand, 5-540
- Reforma**, street, Mexico City, 7-\*87-A
- Reformation, Protestant**, 5-†284  
 Austria, 6-259, 261  
 Counter-Reformation, 6-262  
 Bohemia, 6-259  
 Counter-Reformation, 6-214  
 Switzerland, 6-252  
 destruction of cathedrals and monasteries, 6-\*213  
 effect upon Jews, 5-137  
 England, 6-45, \*47, 48  
 Queen Elizabeth and, 12-395  
 Sir Thomas More and, 13-148  
 Flanders, 6-\*347, \*350; 11-217  
 France, 6-\*174, \*175, 176-77  
 Germany, started by Luther, 6-212, 213; 13-541-44  
 Counter-Reformation, 6-214  
 Holland, 6-354  
 leaders  
 Calvin, 13-547  
 Coheny, 6-177  
 Huss, 13-536  
 Knox, 6-\*116, 121  
 Lollards, 6-†33, 35, 36  
 Luther, 13-†543-44; 6-212  
 Wycliffe, 6-†33, 41  
 Zwingli, 6-251, 252  
 Poland, religious toleration, 6-449  
 product of new era, 6-212  
 Scandinavian countries, 6-388, 398, 400, 413, 420  
 Scotland, 6-116, 121  
 Switzerland, 6-251  
 Counter-Reformation, 6-252  
*see also* Protestantism, and names of churches and religious groups, as Lutheranism; Puritans
- Reformatory schools**, *see* subhead charities and correction under various states for lists of chief reformatory schools of state
- Refraction of light**, 1-†271, †424 fol.
- Refrigerants**, 1-408, 409; 10-546

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Refrigeration**, 10-†515-19; 1-†408-10  
 cold-locker plants, 10-519  
 quick-freezing food process, 10-†519; 9-\*153
- Refrigerator cars**, 10-518, \*514  
 fish transported in, 9-370  
 meat transported in, 9-†329
- Refrigerators**  
 camp, 14-†552  
 electric, working of, 10-†518; 1-410  
 gas, 1-†409, 410, 477  
 Greek jars used for, 12-50  
 movement of air currents in, 1-483
- Regal organ**, musical instrument, 12-223
- Regal python**, 3-494
- Regeneration, power of**  
 ribbon worm, 3-124  
 sea creatures, 3-125, 132, \*133, 139, 169, 179
- Regent**, famous diamond, 9-430
- Regiment**, in U. S. Army, 7-479-F
- Regina**, capital Saskatchewan, 7-29-U
- Regional planning**, in Tennessee, 8-368
- "Regnat Populus,"** motto of Arkansas, 8-30-B
- Regulae**, architectural moulding, 11-\*419
- Regulators**, organized mountaineers, 8-291
- Regulus, Marcus Atilius, story of**, 12-†350-51; 5-\*214
- Regulus**, star, star maps:  
 March and April, 1-178-D  
 May and June, 1-178-F
- "Rehearsal, The,"** drama by Villiers, 13-174
- Rehoboam**, Biblical character, 5-124
- Reich, German**, 6-240
- Reichstag**, German parliament, 6-241-B
- Reichstagsgebäude**, Berlin, 6-\*236
- Reign of Terror**, French Revolution, 6-87, \*189, \*190, 193, 194
- Reims Cathedral**, 11-98, 460, 461
- Reindeer**, 4-†411  
 Alaska, 8-\*12, 13, 16  
 domesticated in Finland, 6-\*464  
 Lapland, 6-\*380, \*381, 405  
 milk, 9-332  
 prehistoric times, 5-33  
 drawings, 5-\*6; 11-\*3, 4; 12-\*106  
 use of, 10-\*133, 134
- Reindeer Age**, art, 11-†1-4; 4-510; 5-33
- Reindeer moss**, 2-78, \*79, 80; 4-412
- Reinforced concrete**, 11-518  
 in bridge building, 10-212  
 in buildings, 9-382
- Reinhard and Hofmeister**, architects, 11-510
- Reinhardt, Max**, Austrian director, 12-334
- Reis, Philipp**, invention to reproduce sound, 10-110
- Relative humidity**, 1-393
- Relativity**, Einstein's theory of, 13-409; 10-304  
 a proof of, 1-†427; 558-G
- Relay**, telegraphic instrument, 10-\*97
- Relief**, in carving, 12-102; 11-†17  
 ivory, 11-\*80  
 Mayan, 7-†90  
*see also* Carving; Relief sculpture
- Relief sculpture**  
 American, 11-\*358, \*377  
 Assyrian, 11-\*26, \*27; 12-\*106  
 Babylonian, 11-\*22; 5-\*13  
 comparison of Greek reliefs with Egyptian and Assyrian, 11-40  
 Egyptian, 11-\*17, \*19  
 Etruscan, 5-\*191  
 French, 11-\*360  
 Greek, 11-†40-42, \*52, \*54  
 Parthenon, 11-\*44, \*422; 5-\*16  
 Italian  
 Niccolò Pisano, 11-†107 9  
 Renaissance, 11-\*124, †125, \*127, †130, \*131, \*132, \*137  
 Persian, 11-\*27, \*29  
 Roman, 12-\*104; 11-\*66, \*67-68, \*107  
*see also* Carving
- "Religio Laici,"** by Dryden, 13-174
- Religion**  
 absence among gypsies, 5-389  
 African Negroes, 5-446  
 American Colonies, 8-412  
 American Indians, 7-69 fol., 91, 92, 100  
 ancestor worship, 5-318  
 ancient Greece, 5-\*148, 153, 154; 14-406  
 music and dancing in ceremonies, 12-\*203, 204  
 ancient Rome, 11-430  
 art influenced by, *see* Religious influence in art  
 Brahmanism, 5-372  
 Buddhism, 5-319, 346, 354, 369-71, 428, 437, 439, 440; 13-520  
 China, 5-319, 325, 331  
 Christianity, *see* Christianity  
 Confucianism, 5-319; 13-515  
 divorced from government in United States, 7-368  
 Druidism, 6-\*1, \*6, \*8, \*110, 137, †143, 144; 10-\*483  
 Egyptian, 5-49, †54, 55, 64, \*67, 69, 73; 11-409  
 Eskimos, 7-36  
 Germany, under Nazis, 7-556  
 India, 5-368 fol., 378, 383 fol.  
 Italy under Mussolini, 7-556  
 Jews, 5-44, 149 fol., 131, 132, 133, 137, 138, 141, 273  
 Malaya, 5-426  
 Manichaeism, 13-532  
 Mohammedanism, *see* Mohammedans and Mohammedanism  
 Monotheism, *see* Monotheism  
 music influenced by, *see* Music, *subheads*  
 ceremonial and sacred  
 new, in nineteenth century, 7-243  
 Pacific islands, 5-523, 529  
 Pascal's "Thoughts" and its value, 13-109  
 Philippine Islands, 5-562, 563, 564  
 primitive, 5-32, 446  
 masks used in ceremonies, 12-96, \*98  
 Russia under Communists, 6-443; 7-556

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Religion—continued**

- Separatist and Puritan ideas, 7-124
- Shintoism, 5-341, 345, 346, 349, 359
- Taoism, 5-319; 13-517
- Three Teachings, Oriental, 13-514
- United States, 7-343-F
- worship, *see* Animals, sacred; Fire worship; Sun worship
- Zoroastrianism, 5-102, 105; 13-12
- see also* God; Gods; Religious biographies; Religious freedom

**Religion in art, *see* Religious influence in art****Religious biographies, main article, 13-†514-554 (*see also* Contents Volume 13)**

- Buddha, 13-†518-20
- Calvin, John, 13-†547-48
- Confucius, 13-†514-16
- Huss, John, 13-†536-37
- Lao-tse, 13-516-17
- Livingstone, David, 13-†551-54
- Loyola, 13-†545-46
- Luther, Martin, 13-†541-44
- Mohammed, 13-†521-23
- St. Augustine, 13-†531-33
- St. Bernard, 13-†534-35
- St. Catherine, 13-†526-27
- St. Francis of Assisi, 13-†528-30
- St. George, 13-†524-25
- Savonarola, 13-†538-40
- Wesley, John, 13-†549-50
- see also names of religious leaders in index, as* Confucius; Loyola; Wesley

**Religious bodies, census of, 7-379****Religious drama, 12-324, 326-27, †328**

- Oberammergau Passion Play, 12-327, †328

**Religious freedom**

- constitutional amendment concerning, 7-368
- first law assuring, 12-504
- Hungary, 6-284
- Maryland, 8-158, 159
- Massachusetts Bay Colony, 8-167
- modern restraint, 7-556
- Hitler's persecution of Jews, 6-240-41
- Pennsylvania, 12-462
- persecution of Mormons, 8-211
- Plymouth colony, 8-166
- Poland, 6-449
- Quakers, 8-334
- Rhode Island, 8-344
- toleration granted Jews by Joseph II, 6-264
- Wycliffe works for, 6-33
- see also* Religious toleration

**Religious influence in art**

- Buddhas depicted, 13-†519; 5-325
- Christian, *see* Christian art
- Egypt, 11-11-14, 16, 19
- Mohammedanism, 11-242; 12-56

**Religious music, *see* Music, subheads ceremonial and sacred****Religious orders**

- abolished in Mexico, 7-84
- medieval, 5-277, 278

**Religious orders—continued**

- see also* Friars, Monks, and names of orders, as Franciscans; Jesuits

**Religious toleration, meaning, 5-273; *see also* Religious freedom****Reliquaries, 12-†21, \*65, 66****Rembrandt van Ryn, 11-†271-76**

- effects gained with light, 11-182, 272
- etchings, 11-273; 10-64
- last years; death, 11-277
- marriage, 11-273
- paintings
  - "Anatomy Lesson," 11-†272
  - "Night Watch, The," 11-†275
  - "Old Woman Cutting Her Nails, An," 11-†276
  - "Portrait of Elizabeth Bas," 11-†276
  - portrait of Jan Six, 11-†274
  - "Saskia in the Red Hat with the Feather," 11-†273
  - self-portraits, 11-†271, \*276, 277
  - "Syndics of the Cloth Hall, The," 11-†275
  - "The Night Watch," 11-274, \*275
  - portrait style, 11-261, 272
  - studied by Goya, 11-308
- "Remember the Alamo!" Texas battle cry, 7-235

**"Rememberer," Greek, 5-153****Remenyi, Eduard, and Brahms, 12-301****Rémi, Saint, story of, in tapestry, 11-†100****Remington, E., and Sons, first typewriters, 10-64****Remora, fish, 3-†199****Remus**

- and Romulus, legends about, 5-†196, \*197, 204
- nursling of wolf, 12-†18

**Renaissance, meaning and origin, 6-299-302; 11-109; 12-328**

- architecture, *see* Renaissance architecture

- art, *see* Renaissance art

- crafts, *see* Renaissance crafts

- England, 6-57; 13-148

- Erasmus a leader, 13-82, 83

- exploration stimulated by, 7-113

- England, 6-57

- Italy, 6-299-302

- Florence, 13-60

- literature

- England, 6-57

- Italy, 6-299; 13-59-62

- music, 12-219 fol.

- printing invented; influence, 10-48

- religious movements, *see* Reformation

- Scotland, 6-123

- spirit embodied in Leonardo and Michelangelo, 11-162

- stimulates exploration, 7-113

**Renaissance architecture, main article, 11-†180-93****Renaissance art**

- compared with Baroque, 11-180

- draws to close, 11-180

- Flemish, 11-†190-203

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

# **Renaissance art—continued**

**German**, 11-†205-14

**Italian**, 11-†107-80

**beginnings**, 11-†107-120

**Florentine artists**, 11-†122-47

**Michelangelo and Leonardo**, 11-†149-62

**Raphael and others**, 11-†149-62

**Venetian**, 11-†171-80

**Spanish**, 11-†243-58

**versatility of artists**, 11-162

# **Renaissance crafts**

**bronze and bronzes**, 12-\*20-21, †22-23

**furniture**, 12-\*183, 185, \*187-88

**glassmaking**, 12-†31-34

**goldsmithery and silversmithery**, 12-\*79, \*85, 88

**ironwork**, 12-\*5 fol., 10

**jewelry**, 12-125

**stained glass windows**, 12-\*72, \*74-75, 77

**tapestry**, 12-†142-44

**"Renaissance,"** poem by Edna St. Vincent Millay, 13-352

# **Reni, Guido, paintings**

**Apollo and his chariot**, 1-\*109

**Christ**, 11-\*184

**portrayal of grief**, 11-\*188

**Samson**, 11-\*185

**Rennet**, in cheese making, 9-345, 346

**Rennin** in gastric juice, 2-356

**Reno, Nevada**, 8-233; university at, 8-231

**Renoir, Auguste**, father of modernist art, 11-380

**paintings**, 11-\*379, †380-82

**amusement place in Luxembourg gardens**, 11-\*379

**"Child Writing,"** 11-\*382

**"Children on the Seashore,"** color plate, 11-  
frontispiece

**landscape**, 11-\*380

**"The Dancer,"** 11-3rd color plate fol. 360

**"Young Girls,"** 11-\*381

**Rensselaer, Kiliaen van**, 7-130

**Rent**, economics, 7-537

**Reparation payments**, after World War I, 6-  
238, 241; 7-339

**Reporters**, newspaper, 10-78, 80

**"Repose during the Flight into Egypt,"** painting by Claude Lorrain, 11-238

**Repoussé work**, 12-80

**Representative government**, 7-353, 355-59; *see also* Democracy

**"Representative Men,"** by Emerson, 13-305

# **Representatives, House of**

**in session**, 7-\*367

**membership**, 7-367

# **Reproduction, biology**

**alternation of generations**, 3-109

**budding**

**coral polyp**, 3-98, 102

**sea anemone**, 3-95

**sponge**, 3-84, 87

**Redi's experiments and discoveries**, 2-278

# **Reproduction, biology—continued**

**reproductive organs of fish**, 3-\*233

*see also* Cells, animal; Eggs and hatching

# **Reproduction, botany**

**algae**, 2-67

**alternation of generations**, *see* Alternation of generations

**by seeds**, 2-125

**cell division in plants**, 2-\*9, 10, 280

**embryo in plants**, 2-104, 125, †126

**ferns**, 2-†89

**function of flowers**, 2-†103-4

**fungi**, 2-74

**grafting**, 2-†231

**lichens**, 2-80

**sexual and asexual**, 2-†83-85, 89

**spores**, 2-76, 88

*see also* Cells, plant; Egg, botany; Pollen and pollination

**Reptile**, meaning of word, 3-434

**Reptiles**, main article, 3-†433 502 (*see also* Contents Volume 3)

**cold blooded**, 3-434

**crocodiles and alligators**, 3-†436-45

**eggs**, 3-39

**general characteristics**, 3-434

**lizards**, 3-†447-63

**prehistoric**, 3-†433 34

**first appearance in Permian period**, 3-†32.  
35, \*38, 64

**in Mesozoic era**, 3-†37-44, 56

**disappearance**, 3-48, 49

**scales**, 3-482

**serpents**, 3-†482-502

**third class of vertebrates**, 3-†68

**tortoise, turtle, and terrapin**, 3-465-80

**water reptiles**, 3-40

**zoo**, 4-478

# **Reptilian Age**, 3-433

**Republic**, form of government, 7-348

**Greek form of**, 7-348

**modern form of government**, 7-357

**Roman form of**, 7-348; 5-201

**smallest, in world**, 6-467

**U.S.S.R.**, 6-443-B

**"Republic,"** of Plato, 13-7

**"Republic,"** of Zeno, 13-12

# **Republican (Jeffersonian) party**

**in early Republic**, 7-193, 195-200, 203, 207

# **Republican (present) party**

**after 1930**, 7-\*339, †340-41, 341-B, 342 fol.

**and capitalists**, 7-285

**beginning of**, 7-250, 371

**founded by Hamilton**, 7-193

**in 1860**, 7-250

**Liberal-Republicans of 1872**, 7-274

**party control, 1877-97**, 7-†285-92

**power after World War I**, 7-333, 335

**principles**, 7-371

**prosperity under McKinley and Hanna**, 7-302

**split by Progressives in 1912**, 7-311; 12-546

**tariff policy**, 7-302

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



- Republican River**, U. S.  
 Kansas, 8-131  
 Nebraska, 8-228
- Republicans**, Democratic, early political party, 7-222
- "Requiem,"** by Gounod, 12-307
- "Requiem Mass,"** by Mozart, 12-237, 258-B
- Research laboratories**, 10-556
- Reservations**, Indian, *see* Indian reservations
- Reserve Officers Training Corps**, U. S., 7-474-75
- Reserves**, U. S. Army, 7-474
- Reservoirs**  
 city water supplies, 10-538, \*539, †540  
 irrigation systems, 10-528, 531 fol.
- Resettlement Administration**, 7-342, 8-13
- Reshevsky, Samuel**, chess champion, 14-488
- Resin**, in evergreens, uses, 2-94  
 insects trapped in, become fossilized, 3-18  
 source and derivatives, 9-313
- Resins**, chemical compounds: in plastics, 10-552  
 in tanning, 9-70
- Resistance**, electrical, 1 †515  
 tungsten, 9-442
- "Resolute,"** yacht, 14-530
- "Resolution,"** Captain Cook's ship, 7-\*18
- Resorts**: California, 8-41  
 Florida, 8-14  
 Maine, 8-155  
 New Hampshire, 8-237  
 New Jersey, 8-246, 249  
 New Orleans, 8-145  
 New York State, 8-265  
 South Carolina, 8-355  
 Vermont, 8-403  
 Virginia, 8-415
- Respiration**, artificial, *see* Artificial respiration
- Respiration**, *see* Breath and Breathing; Lungs
- Respiration of plants**, main article, 2-†48-53
- Respiratory center of brain**, 2-340
- Respiratory muscles**, 2-340
- Responsible government**, defined, 5-556  
 Canada's struggle for, 7-15-18
- "Rest on the Flight into Egypt, The,"** painting by Gerard David, 11 2nd color plate fol. 360
- Restoration**, in England, 6-70, 72
- Resurrection**, celebration of the, 14-581, †582
- "Resurrection, The,"** painting by Mathias Grünewald, 11-\*207
- Resurrection plant**, protective dormancy, 2-207
- Resuscitation of drowned**, 2-†408-10
- Retail stores**, 7-538
- Rete Malpighii**, layer of epidermis, 2-288
- Reticello**, lace, 12-164, \*167
- Retief, Pieter**, 5 482
- Retina**, 2-296, 297, 298, \*299; 1-†436, 437  
 theory of color vision, 1-440
- Retreat of the Ten Thousand**, 5-177
- "Retrospection and Introspection,"** autobiography of Mary Baker Eddy, 13-556, 557
- Retting**, of flax, 9-47; of jute, 9-310
- "Return of the Native, The,"** by Hardy, 13-264
- "Reunion in Vienna,"** comedy by Robert Sherwood, 13-355
- Reuter, Julius**, news-gathering agency, 10-79
- Reval (Tallinn)**, Esthonia, 6-\*459, \*462, 463
- "Revenge,"** English fighting boat, 12-\*404; 6-489
- "Revenge of Hamish, The,"** poem by Sidney Lanier, 13-335
- Revenue**, internal, method of collecting, 7-376
- Revenue stamps**, 7-377; 9-224
- Revere, Paul**  
 ride of, 7-\*161, 164  
 silversmithery, 12-90, \*91
- Reverend Wilkes**, apple tree, 2-\*264
- Revett, Stuart and**, "The Antiquities of Athens," 5-18; 11-288
- "Review,"** Defoe's forerunner of newspaper, 13-176
- Revival of Learning**, 11-482; *see also* Renaissance
- "Revolt in the Desert,"** by T. E. Lawrence, 5-401
- "Revolution, The,"** suffrage paper, 12-572
- Revolution, American**, *see* Revolutionary War
- Revolution, Industrial**, *see* Industrial Revolution
- Revolution**, in France  
 1789, *see* French Revolution  
 1830, 6-198  
 1848, 6-198
- Revolution, Russian**  
 early struggles for liberty, 6-435 fol.  
 overthrow of Czarist government, 6-\*437, 439
- Revolution of 1688**, England, 6-72
- Revolution of Ayotla**, Mexico, 7-84
- Revolutionary War**, 7-†162-70  
 British tactics, 8-277  
 Burke's sympathy with colonists, 13-201  
 cannon and cannoneer, 10-\*362  
 causes; events leading to, 7-157-62; 6-81  
 coal used to make cannon balls, 9-436  
 colonial army, 7-472  
 colonial naval force, 7-482  
 colonists defended by Sheridan, 13-206  
 Continental Congress, 7-164, 167; *see also* Continental Congress  
 Declaration of Independence, *see* Declaration of Independence  
 disadvantages  
 American, 7-167, 168  
 British, 7-168  
 effect on Americans' confidence, 8-326  
 events  
 André as spy, 12-\*484, 485  
 Arnold's treason, 12-487, 492  
 British harried in South Carolina, 8-352  
 Bunker Hill, 7-†164  
 Burgoyne's surrender, 7-\*168, 170  
 Camden, 12-452  
 Champe catches Arnold, 12-492-93  
 first blood shed, 7-355  
 Guilford Courthouse, Battle of, 8-292  
 in Canada, 7-\*11, 12  
 Lexington and Concord, 7-\*163, 164

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Revolutionary War, events—continued**

- Long Island, 7-167
- Moore's Creek Bridge, 8-292
- naval victories of John Paul Jones, 12-†501-2
- Paul Revere's ride, 7-164
- Ticonderoga, 12-†495
- Trenton, 7-\*169
- Valley Forge, 12-453, \*454, \*475
- Yorktown, 12-478, 508; 7-170
- flag adopted by colonists, 14-574
- France's part in, 12-450, 451, 455, 466, \*467
- money supplied by Beaumarchais, 12-451; 13-121
- recognition of independence, 7-170
- foreigners who aided colonists**, 12-†450-56
- Hessians, 7-169
- Jefferson's essay partly responsible for, 12-504
- leaders and famous figures
  - Adams, 12-480
  - De Kalb, 12-452
  - Franklin, 12-451, 466, \*467; 7-170
  - Hamilton, 12-508
  - Henry, Patrick, 12-483
  - Jones, John Paul, 12-500, 501-2
  - Kosciusko, 12-455
  - Lafayette, 12-†450 fol.
  - Nathan Hale, 12-†497-98
  - Otis, 7-\*363
  - Pulaski, 12-455
  - Putnam, 12-494
  - Rochambeau, 12-456
  - Steuben, 12-453, †454, 456
  - Washington, 12-†475-78
  - Wayne, 12-†491-92
- loyalists, 7-13, 168; 8-290
- marines' part in, 7-\*492, 493
- memorials, 7-412
- Minutemen, 7-164
- New York a center, 8-277
- organization for officers, 8-307
- Peace Conference at Paris, 6-81; 7-170
- Pennsylvania's part, 8-336
- problems following war, 7-175 fol.
- South Carolina, 8-351
- Spain and Holland join against England, 7-170
- turning point in war, 7-170
- uniform of officer, 7-\*473
- Washington's part in, 12-†475-78; 7-169 fol.
- Revolver**, 10-364
- Revolving bridges**, 10-214
- Revolving Library** of York and Kittery, Maine, 10-557
- "Reward of Kindness,"** Porcelain Pagoda, 12-\*100
- Reykjavik**, Iceland, 6-\*485
- Reynard the fox**, animal, 4-303
- "Reynard the Fox,"** story, text, 14-†323-28
  - early French poem, 6-169
  - poem by Masfield, 13-270
- Reynolds, Sir Joshua**, life and painting, 11-†298
- and Gainsborough, rivalry between, 11-302
- friend of Dr. Johnson, 13-\*194, 195

**Reynolds, Sir Joshua—continued**

- paintings, 11-\*295-98
  - "Age of Innocence, The," 11-\*297
  - "Heads of Angels," 11-\*295
  - imaginary portrait of Samuel, 11-\*296
  - "Mrs. Siddons as the Tragic Muse," 11-\*298
  - portrait of Dr. Johnson, 13-\*195
  - style, 11-294
- Reytan, Thaddeus**, Polish noble, 6-\*451
- Rezzonico, Palazzo**, in Venice, 11-\*487
- R.F.C.**, *see* Reconstruction Finance Corporation, 12-456-D
- Rhaetia**, becomes part of Frankish empire, 6-246
- Rhaetians**, ancient people, 6-244
- Rhapsodies**, by Franz Liszt, 12-298
- Rhapsody**, musical composition, 12-246
- Rhea**, American ostrich, 4-†235
  - eggs and hatching, 4-236
- Rhea**, goddess, saves Jupiter, 14-407
- Rheims Cathedral**, *see* Reims Cathedral
- "Rheingold, Das,"** ("The Rhinegold"), opera by Richard Wagner, 12-295, 296; 14-311
  - brasses used in, 12-258-B
  - horns used in, 12-258-B
  - trumpets, 12-258-B
- Rhenium**, element, symbol, atomic no. and wt., 1-\*551
- Rhett, William, Captain**, capture of Stede Bonnet, 8-288
- Rhine**, river, Europe, Switzerland to North Sea, 10-254, 256; 6-\*235
  - Army of Occupation on, after World War I, 7-331
  - Austria, 6-265
  - Caesar's bridge, 12-358
  - castles, 7-\*350; 10-356, \*361, 11-\*488
  - Holland, 6-352
  - length, 10-253
  - maps, 6-582, 585
  - on map of Europe, 6-570
  - Mouse Tower, 6-†207
  - mouths, 6-355-A
- Rhine, Confederation of the**, 6-224
- Rhine Maidens**, characters in Wagner's "The Rhinegold," 14-\*311
- Rhinegold**, *see* Rheingold
- Rhineland**, French occupation during World War I, 6-202
- Rhinoceros**, 4-†345-48
  - African, 4-†346-47
  - drawing and mounting, 14-\*68
  - giant, 5-437
  - Indian, 4-\*345, \*346, 347
  - meaning of word, 4-346
  - pygmy, 4-348
  - Tertiary period, 3-46, \*47-48, †52-54
- Rhinoceros auklet**, bird, 4-205
- Rhinoceros beetle**, 3-340
- Rhinoceros bird**, 4-346
- Rhinoceros hornbill**, bird, 4-\*194
- Rhinoceros iguana**, lizard, 3-\*452, †453

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Rhizome**, of fern, 2-87
- Rhode Island**, state, U. S., description and history, main article, 8-†343-46; general data, 8-347
- agriculture, 8-346
- area, 8-347
- charities and correction, list, 8-347
- cities, towns, list, 8-347
- industries, 8-346
- climate, 8-347, 346
- colonized, 7-126
- counties, list, 8-347
- education, 8-346
- institutions of higher learning, list, 8-347
- evidence of Norse settlements, 7-112
- first cotton mill in, 9-34
- flag, 8-347
- holidays, 8-347
- Indians, 8-343-44
- interesting facts, 8-347
- location, 8-347
- map, 8-543
- on United States map, 7-595
- motto, 8-347
- name, 8-347
- nicknames, 8-347
- physical features, 8-344, 347
- political facts, 8-347
- products and industries, 8-344-46
- rivers, 8-347
- settlement, 8-313
- signs Declaration of Independence, 7-173
- Statehouse, 8-\*343
- state bird, 8-347
- state flower, 8-347
- state song, 8-347
- trade, 8-344-45
- water power, 8-†345
- "Rhode Island and the Providence Plantations,"** 8-344
- Rhode Island Red**, breed of chicken, 9-\*350
- Rhodes, Cecil**, 5-486, \*487
- and South African Union, 5-486
- diamond monopoly created, 9-430
- portrait, 5-\*487
- scholarship created, 5-187
- Rhodes**, island, Mediterranean Sea, history and culture, 6-†478
- harbor, 6-\*477
- mills on Mole of St. Nicholas, 6-\*478
- Rhodes, Colossus of**, 5-\*186, 187; 6-478; 11-55
- Rhodes Scholarships**, 5-487
- Rhodesia**, region, So. Africa, general data, 5-491-B
- area, 5-491-B
- climate, 5-491-B
- government, 5-491-B
- location, 5-491-B
- map, 5-577
- mineral deposits, 5-491-B
- people, 5-491-B
- physical features, 5-491-B
- Rhodium**, element, symbol, atomic no. and wt., 1-\*551
- Rhododendron**, shrub, structure, 2-172
- West Virginia's state flower, 8-436-B
- Rhodope Mountains**, Bulgaria, 6-368-A
- Rhodri the Great**, Welsh king, 6-138
- Rhone basin**, Europe, climate, 6-202-B
- Rhone River**, Europe, 10-255, 256; 6-254-B
- length, 10-253
- maps, 6-579, 581, 584
- Rhyme**, used by Irish poets, 6-144
- "Rhyme of the Ancient Mariner,"** by Samuel Coleridge, 13-215
- Rhymed couplet**, plays written in, 12-331
- Rhymes**, see Mother Goose
- Rhys ap Griffith**, Welsh prince, 6-139
- Rhythm**
- "free rhythm," in music, 12-212
- probable origin, 12-202
- rhythmic line in art, 11-145
- Rialto**, bridge, Venice, 11-\*487; 10-214
- Rib**, anatomy, see Ribs
- Rib-faced deer**, 4-413
- Rib Hill**, mountain, Wis., 8-446
- Rib-nosed baboon** (mandrill), 4-†260
- Rib roast**, amount from steer, 9-†328
- Ribault**, or **Ribaut**, Jean, French navigator
- Huguenot colony headed by, 8-349
- North Carolina named by, 8-296-A
- Ribera, José**, (Lo Spagnoletto), paintings, 11-248
- "Isaac Blessing David," painting, 11-\*247
- Ribbon worm**, 3-124
- Ribs**
- color plate, 2-\*278
- use in breathing, 2-337
- Riccardi Palace**, Florence, 11-\*483
- Rice, Elmer**, dramatist, 13-355
- Rice, cultivation; location**, main article, 9-†108-11
- Annam industry, 5-430
- by-products, 9-110
- grinding, in China, 9-\*234
- grinding, in Japan, 5-\*356
- Japanese rice field, 5-357
- Louisiana, 8-145
- nutritive value of unpolished, 9-111
- Philippine industry, 5-\*566, \*568
- polished, 2-262
- Rice fields**, irrigation, 10-533
- Rice State**, nickname for South Carolina, 8-356-A
- Ricebirds** (bobolinks), 4-88
- Ricebirds**, nickname for people of South Carolina, 8-356-A
- Richard I, the Lion-hearted (Coeur de Lion)**, king of England, life, main article, 12-†371-73; 6-23
- aided by St. George during siege of Antioch, 14-573
- and Saladin, 12-\*372
- crusade, 5-283, \*296; 6-22; 12-373
- in Aquitaine, 12-372

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Richard I**—*continued*  
 in story of Robin Hood, 14-354  
 sells independence to William the Lion, 6-113
- Richard II**, king of England, reign, 6-†32-34  
 and Chaucer, 13-143  
 and Ireland, 6-149  
 portrait, 6-\*32
- Richard III**, king of England, 6-38, 39
- Richard**, duke of Gloucester  
 treatment of young princes, 6-\*38, 39  
*see also* Richard III, king of England
- "Richard II,"** drama by Shakespeare, 13-158
- "Richard III,"** by Shakespeare, 13-157
- "Richard Carvel,"** novel by Winston Churchill, 13-347
- "Richard Cory,"** poem by Robinson, 13-349
- "Richard Feverel, The Ordeal of,"** by George Meredith, 13-263
- Richard of the Lees, Sir**, in story of Robin Hood, 14-354
- Richard Yea-and-Nay** (Richard I, the Lion-hearted), 12-371
- Richardson, H. H.**, architectural work of, 11-512, \*515
- Richardson, James**, Sahara Desert explored by, 5-454
- Richardson, Samuel**, life and works, main article, 13-†186-88  
 portrait, 13-\*186
- Richardson's ground squirrel**, 8-302-A
- Richelieu, Armand Jean du Plessis**, Duke of, cardinal, rules France, 6-†180  
 calls Poussin to decorate Louvre, 11-236  
 Madagascar given to French by, 5-464  
 portrait, 6-\*180
- Richmond, Henry Tudor**, earl of, *see* Henry VII, king of England
- Richmond, Va.**, 8-416  
 capital of Confederacy, 8-412  
 Civil War, 7-260, 264, 265  
 nearby coal and iron deposits, 8-415  
 preservation of battle fields, 8-418-A  
 shells found in rocks, 3-80  
 statue of Lee, 8-\*406
- Rickard, R. E.**, music to "Hail! Minnesota" by, 8-198-A
- Rickard, Truman**, words to "Hail! Minnesota" by, 8-198-A
- Rickenbacker, Edward**, aviator, 7-479-F
- Rickets**, prevented by Vitamin D, 2-321, 363, 365
- Ricksha**, *see* Jinrikisha
- Riddle of Sphinx**, 14-†444
- Riddles**, 14-†90-93; answers, 14-94  
*see also* Puzzles
- Ridge**, in physiography, 1-25
- "Ridiculous Intellectuals, The,"** by Molière, 13-112
- Riding Mountain Park**, Manitoba, 7-29-V
- Ridley, Nicholas**, bishop, execution, 6-48
- Riebeeck, Jan van**, in Africa, 5-\*476, 477
- Riel, Louis**, leads rebellions of Métis, 7-24, 26  
 yields to Strathcona, 13-565
- "Rienzi,"** opera by Richard Wagner, 12-294, †295
- Rifle**, 10-364
- Rift**, physiography, 5-473-A
- Rig-Veda**, Hindu literature, 5-368, 369
- Riga**, capital of Latvia, 6-460  
 commerce and industry, 10-259  
 map, 6-600, C3  
 rainfall and temperature, 6-464-A
- Riga, Gulf of**, Baltic sea, map, 6-597
- Riga, Mount, Conn.**, elevation, 8-62
- Rigel**, star, star maps  
 March and April 1-178-D  
 Nov. and Dec., 1-178-L
- Rigging of sailing ship**, 10-171
- Right**, political meaning of, 7-335
- Right angle**, geometry, 10-437
- Right-hand turn**, driving, 2-442  
 diagram, 2-444
- Right triangle**, geometric figure, 10-†439
- Right (whalebone) whale**, 4-\*443, 445, 447  
 enemy of shark, 3-198
- Rights of man, Declaration of**, 6-191
- "Rights of man"** in constitutional amendments, 7-368
- "Rigoletto,"** opera by Verdi, 12-300
- Rigsdag**, governmental body, Denmark, 6-416-B
- Riksdag**, Swedish national assembly, 6-396
- Riley, James Whitcomb**, life and works, main article, 13-†337-38  
 imitation of Poe, 13-338  
 memorial, 13-\*337  
 portrait, 13-\*337
- "Rime of the Ancient Mariner,"** by Samuel Coleridge, 13-215, 218
- Rimsky-Korsakov, Nadejda** (wife of Nikolai Rimsky-Korsakov), 12-313
- Rimsky-Korsakov, Nikolai**, life and works, main article, 12-312-13, 255  
 portrait, 12-\*313
- Rinehart, William H.**, statue by, 11-\*373
- Ring**, annual, of tree, 2-\*28, †29
- Ring**, perilous, game, 14-158
- "Ring and the Book, The,"** by Robert Browning, 13-†252
- Ring-necked pheasant**, bird, 4-96, 187
- Ring-necked plover**, bird, 4-116
- "Ring of the Nibelungs,"** operas by Wagner, 12-251, 295, 296; 14-310  
 brasses used in, 12-258-B
- Ring-tailed lemur**, 4-268
- Ring-tailed opossum**, 4-468
- Ring-tailed raccoon**, 4-†324
- Ringed seal**, 4-334
- Ringhals**, snake, 3-\*493
- Rings**, jewelry  
 enamelled porcelain, 12-\*64  
 glass mosaic, 12-110  
 gold, bushel of, taken after battle, 5-215  
 iron, 12-124  
 marriage or betrothal, 12-\*87  
 poison, 12-118

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Rings, jewelry--continued**

uses of, 12-117, \*119, †124  
as seal, 12-\*87, 117, †119, 122

**Rings of Saturn, 1-†156, \*158**

explained by Huygens, 13-377

**Rio de Janeiro, city, Brazil, 5-\*509**

Chamber of Deputies, 5-\*506

commerce, 10-241

map of city and vicinity, 5-603

Monroe Palace, 5-\*515

Portuguese court at, 5-507

rainfall and temperature, 5-518-F

**Rio de Janeiro, river, Brazil, map, 5-603****Rio de Janeiro Bay, Brazil, 5-603****Rio de la Plata (Plata River), South America, 5-494**

map, 5-604

**Rio de Oro, colony, Africa, 5-455****Rio de Oro, river, Africa, map, 5-574****Rio Grande, river, North America, boundary between United States and Mexico, 8-52-A, 386**

basin area, 10-257

Elephant Butte Dam, 8-\*382

maps, 7-596, 594

New Mexico, 8-262

**Rio Grande, river, Philippine Islands, 5-570****Rio Grande Bird Refuge, 8-262-A****Rio Grande Valley**

climate, 8-262, 386

New Mexico, 8-262

**Rio Muni, colony, West Africa, map, 5-576****Rio Negro, river of South America with the Amazon for its outflow**

length, 10-253

map, 5-602

**Rio Pecos, see Pecos River****Rio Verde, see Verde River****Riouw-Lingga Archipelago, island group in Dutch East Indies, 5-529-B**

map, 5-596

**"Rip Van Winkle," by Washington Irving, 13-294, 295****Rip Van Winkle State, nickname for North Carolina, 8-296-A****Riposte, in fencing, 14-\*513, 514****"Rise of Silas Lapham, The," by William Dean Howells, 13-332****"Rite of Spring, The," by Igor Stravinsky, 12-255****Rites and ceremonies**

act of fealty, feudal ceremony, 5-293

American Indian

coming to manhood, 7-102

dancing, 7-96, \*97, 104

medicine men, 7-96, 100

smoking of peace pipe, 7-106

Blood Compact in Philippines, 5-564

Druid, 6-6

Greek, honoring Bacchus, 12-\*203, 204; 13-33

knighthood ceremony, 5-307; 14-\*389

prehistoric man, 5-32

**Rites and ceremonies--continued**

tea ceremony, Japan, 5-\*360, 9-139

Viking funeral, 6-†376

**Ritsuo, Japanese artist, 5-359****Ritter, Alexander, and Richard Strauss, 12-315****Ritual murder, Jews accused of, 5-136****"Rival Performers, The," picture by Horsley, 12-\*249****"Rivals, The," by Richard Sheridan, 13-205****Rivas, Venezuelan patriot, 12-437****River, (Eridanus), constellation, star maps:**

Jan. and Feb., 1-178-B

March and April, 1-178-D

Nov. and Dec., 1-178-L

**River basins, areas, list, 10-257****River gaps, in West Virginia, 8-436-A****River horse (hippopotamus), 4-\*437, 439****River of Doubt, see Roosevelt River****"River of Light," diamond, 12-120****Rivera, Diego, painting by, 11-\*392-B****Rivera, Primo de, Miguel, see Primo de Rivera, Miguel****Riverby, John Burroughs' home, 13-426****Riverhead, Long Island, N. Y., trans-oceanic receiving station, 10-\*117****Rivers, main article, 10-†252-68**

alluvial soil deposited by, 1-97

animal life in, 3-†222-24

fish in, 3-230, 232, 235 fol., 244 fol.

shellfish, 3-254 fol.

basin areas, list, 10-257

bayous, 8-27

canals, 5-60; 10-274

cascades and cataracts, 5-473-A

coulees, 8-428

damage caused by floods, 7-468

delta, 5-48

drinking water provided by, 10-542

during Ice Age, 1-60

Europe, 6-162-C

formation, 1-†46-49

ice obtained from, 10-\*516

industries

agriculture along fertile banks, 5-47

fishing, 9-366, 368

shells gathered for buttons, 3-262; 9-51, \*52

inland, 5-444

irrigation provided by, 10-528 fol.

largest in world, 5-467

lengths

foreign, 10-253

United States, 10-255

logs floated down, 9-\*251, 252

longest river valley, 7-213

salt in, 3-75; 1-44

Sanskrit word for, 8-116

source of water power, 1-369-70, 508

Coosa, 8-2

Mississippi, 1-370; 9-236

Spokane, 8-428

South America, 5-518-A

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Rivers—continued**

- transportation  
 American frontiersmen use, 7-213-15  
 American explorers use, 7-2, 3, 136, \*207, \*209  
 importance to industry, 7-206  
 Nile, 10-161  
 Ohio, 8-307, 308, 310  
 Russia, 6-368  
 steamboats, 7-214, 217, \*218  
 tubes, 10-\*202, †206, 207  
 underground, 1-\*89, 92  
*see also names of rivers, as Hudson River; Rhone, river, and also subhead rivers under names of countries*
- Rivets**, in steel construction, 1-479
- Riviera**, region along Mediterranean Sea, 6-466  
 Italian, 6-315-B
- Rivière, Madame**, portrait by Ingres, 11-\*324
- Rivoli, Battle of**, 6-\*305; 12-\*424
- Rizal, José**, Filipino leader, 5-568
- "Rizpah,"** statue by Joseph Mozier, 11-\*375
- Rizzio, David**, 12-\*398, 399, \*400
- R K O Building**, New York, 11-\*510
- Roach**, fish, *see* Shiner
- Roach**, insect, *see* Cockroach
- Road runner**, bird, 4-\*141, †142  
 color plate, 4-\*89  
 nest building and breeding, 4-143
- "Road to Rome, The,"** comedy by Robert Sherwood, 13-355
- Roads**, main article, 10-†150-56  
 automobile industry promoted by, 8-184  
 concrete, expansion and contraction, 1-479  
 early American, 10-146, 148, 152  
 European, during early and middle ages, 10-151  
 express highways, 10-156  
 first in Ohio, 8-310  
 government grants for, 10-156  
 highway act, North Carolina, 8-295  
 lighting, 10-549  
 logging, 9-248  
 modern, how made, 10-152, †154-56  
 Roman, 10-†150, \*152, 31; 5-19  
 state responsibility for, 7-\*388, †389  
 United States, 10-153-56  
 U. S. Route 40, 8-308  
 Virginia, 8-416  
*see also Driving*
- Roadways, water**  
 inland waterways, 10-†252-68  
 ocean highways, 10-†231-42, 163  
*see also Canals*
- Roan antelope**, 4-\*419  
 horns, 4-\*421
- Roan or Book Plateau**, Colo., 8-52-A
- "Roan Stallion,"** poem by Robinson Jeffers, 13-353
- Roanoke, Va.**, 8-416
- Roanoke Island**, N. C., settlement on, 8-286

- Roanoke River**, Virginia and North Carolina, 8-418  
 North Carolina, 8-296
- Roaring forties**, winds, 1-225
- "Roast Pig, Dissertation on,"** by Charles Lamb, 13-224
- "Rob Roy,"** by Sir Walter Scott, 13-222
- Robber ant**, 3-323
- Robber crab**, 3-\*181
- Robber fly**, 3-365
- "Robbers, The,"** by Schiller, 13-278
- Robbia, Luca della**  
 carvings, 11-130, \*131  
 mastery of goldsmith's art, 12-88  
 work in glazed terra-cotta, 11-†130; \*131
- Robert**, king of Naples  
 court, 13-63  
 daughter, 13-64
- Robert I**, king of Scotland, *see* Bruce, Robert de
- Robert II**, king of Scotland, 6-117
- Robert III**, king of Scotland, 6-118
- Robert Guiscard** (of Sicily), 5-297
- "Robert of Lincoln"** (bobolink), 4-\*88
- Roberts, Bartholomew**, pirate, 10-170
- Roberts, Charles George Douglas**, life and works, main article, 13-576-77
- Roberts, Elizabeth Madox**, author, 13-352
- Roberts, Frederick Sleigh**, earl, in Boer War, 5-488
- Roberts, Marshall O.**, portrait, 10-\*101
- Robertson, James**, founding of Nashville, 8-366
- Roberval, Sieur de**, 13-474
- Robespierre, Maximilien Marie Isidore**, 6-†192, 194  
 governs France, 6-194  
 insurrection in Paris led by, 6-192  
 portrait, 6-\*192
- Robin**, bird, 4-†19-20  
 Australian, 4-\*18  
 color plate, 4-\*88  
 English, 4-†171, \*172  
 members of thrush family, 4-52  
 Michigan's state bird, 8-186-B  
 nest building and breeding, 4-19  
 odd sites chosen, 4-\*15, \*18  
 protection by law, in Virginia, 8-418-A  
 song, 4-19  
 graph of, 4-\*5  
 young robin, 4-\*12
- Robin Hood and His Merry Men**, story, 14-†353-60  
 development of the stories, 14-353  
 printed versions, 14-354
- Robin Redbreast**, bird, 4-†171, \*172
- Robinson, Edwin Arlington**, 13-348  
 Arthurian romances retold by, 13-349  
 background of period, 7-335  
 portrait, 13-\*352
- "Robinson Crusoe,"** by Daniel Defoe, 13-177
- Robinson cup anemometer**, 1-\*274
- Robusti, Jacopo**, *see* Tintoretto
- Roc**, fabled bird of Africa, 5-464

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Roca, Cape**, Portugal, Longitude, 6-162-C  
**Rochambeau, Jean Baptiste Donatien de Vi-**  
**meur**, count, 12-456  
**Rochdale**, England, cooperative experiment, 7-  
 553  
**Rochester**, Minn., industries, 8-196  
**Rochester**, N. Y., industries, 8-280; 9-236  
**Rock**, *see* Rocks  
**Rock bass**, 3-\*239  
**Rock carving**, *see* Stone carving  
**Rock Creek**, Montana, sapphire production, 8-218  
**Rock crystal** (quartz), 1-537  
   carved by Chinese, 12-100  
   sandstone contains, 1-95  
**Rock dove**, 4-79  
**Rock hopper birds**, 4-221  
**Rock Island**, Ill., industries, 8-104  
**Rock Island Dam**, 8-428-A  
**Rock maple**, wood, 2-260  
**Rock of Chickamauga** (George H. Thomas),  
 7-264  
**Rock of Gibraltar**, *see* Gibraltar  
**Rock of the Sun**, Aztec calendar, 10-\*477  
**Rock ptarmigan**, bird, 4-230  
**Rock rabbits**, 4-†345  
**Rock River**, U. S., 8-106  
   Wisconsin, 8-446  
**Rock rose**, pollination, 2-\*108  
**Rock salt**, deposits, 9-411, 414  
   Europe, 6-162-D  
   methods of securing, 9-412, \*413, †414  
   Neyba Valley, 7-54-A  
   South America, 5-518-B  
**Rock snakes**, 3-494  
**Rock weeds, algae**, 2-\*66  
**Rock wool**, insulating material, 9-386  
**Rockefeller, John D., life**, 12-†582-84; 7-282  
   portrait, 12-\*582  
   University of Chicago founded, 8-105  
**Rockefeller, John D., Jr.**, 7-412  
**Rockefeller Center**, New York, 11-†510  
   mammoth mosaic, 12-115  
**Rockefeller Foundation**, 12-583  
**Rockefeller Institute for Medical Research**,  
 12-583  
**Rocker arm**, Diesel engine, 10-\*276  
**Rocket**, imaginary trip in, 1-†136-43; †299-301  
   study of atmosphere, 1-128; 10-\*365  
**"Rocket,"** Stephenson's locomotive, 10-†181,  
   \*186, 188  
**Rocket bomb**, 10-368-F, \*365  
**Rocket propulsion**, *see* Jet propulsion  
**Rockford Seminary**, Jane Addams graduate of,  
 12-580  
**Rocking chair**, 12-198  
**"Rocking stone,"** Bronx Park, New York, 1-\*60  
**Rockland State Hospital of Mental Hygiene**,  
 Orangeburg, N. Y., 7-\*441  
**Rocks**, main article, 1-†51-54  
   action of outside forces on  
     bored by sea creatures, 3-154, 156  
     crumbled by bacteria, 2-20  
**Rocks**, action on—*continued*  
   glaciers, 1-†60, \*62, \*63, 97,  
     heat and cold, 1-41  
   sea, 1-\*69, †70, \*71, \*72; 3-4  
   water, 1-48, 78, \*94, 95, 96  
     bridges caused by 1-†53  
     wind, sand, and rain, 1-41, 95  
   age determined, 1-43, 542  
     oldest, 3-8  
   bed rock, 1-\*97  
   Belgian, evidence extreme age, 6-351  
   below ocean floor, 1-67  
   Catskill and Adirondack compared as to type,  
     8-265  
   common varieties, 1-54  
   curious formations, 1-18, \*21, \*39 fol., \*53-54,  
     \*62, \*69 fol., \*94; 7-\*418, 419  
   drilled by diamonds, 9-431  
**earth's history recorded in**, 3-†1-6; *see also*  
   Fossils; Geology  
   escarpments, 8-266  
   expansion and contraction, 1-41  
   faults cause earthquakes, 1-81  
   first formed, 1-40, 41  
     oldest, 1-67; 3-8  
   geologic divisions, 1-†40  
   igneous, 1-11, 19, 40; 3-2  
     fossils never found in, 3-3  
     primary rock, 1-40  
   Lyell's studies and theory of, 13-430-31  
   mantle rock, 1-97  
   mountain building, 1-20  
   New York State, 8-265, 266  
   origin of salt in, 1-44  
   primary, 1-40, 41  
   ripple marks, 3-\*2  
   sedimentary, 1-\*19, 20; 3-3  
     diagram of layers, 1-†40  
   fossils found in, 3-3  
   solid, 1-40  
   story of glaciers told by, 1-60  
   strata and fossils, 3-2, †3, \*62, \*63  
     color plate, 3-frontispiece  
   trap rock, 8-268  
   underground water veins in, 1-90, \*91  
   water in, 1-364  
   *see also names of rocks, as* Limestone; Sandstone  
**Rocky Mountain Biological Laboratory**, 8-  
 52-A  
**Rocky Mountain goat**, 4-\*427, \*429  
**Rocky Mountain locust**, 3-368  
**Rocky Mountain National Park**, 8-52-B; 7-407  
**Rocky Mountains**, North America, 7-343-10,  
 33-A, 29-U-V, \*33-J; maps, 7-592, 594  
   age, 1-21  
   Alaskan extensions, 8-16  
   chinook (wind), 1-231  
   Colorado, 8-52-A; Pikes Peak, 8-47  
   discovery, 13-†362-64  
   Front Range of the Rockies, 8-454  
   Montana, 8-215, 216, 220  
   Mount Eisenhower, color plate, 7-\*22

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Rocky Mountains**—*continued*

- Texas, 8-377
- tunnel, 10-206
- Wyoming, 8-449, 454
- Rocky Point**, N. Y., transoceanic transmitting station, 10-113, \*117, 121
- Rococo style**, 12-190
  - architecture, 11-491
  - art, 11-280
  - ironwork, 12-\*9
  - Versailles decorations, 11-282
- Rod**, unit of measure, 10-375
- Rodents**, main articles, 4-†364-88
  - largest, 4-378
- Roderick**, king of the Visigoths of Spain, defeated by Moors, 6-320
- "Roderick Random,"** by Tobias G. Smollett, 13-190
- Rodin, Auguste**, sculptures, 11- \*347-49, 350
  - "Burghers of Calais," sculpture, 11-\*348
  - "The Kiss," sculpture, 11-\*347
  - "The Thinker," sculpture, 11-\*349
- Rodriguez, Abelardo**, Mexican president, 7-87
- Rods of eye**, 2-298
- Roe**, fish eggs, 3-245; 9-368
- Roemer, Ole**, measured speed of light, 1-155
- Roentgen rays**, *see* X rays
- "Roger de Coverly Papers,"** 13-182
- Rogers, James Gamble**, library designed by, 10-559
- Rogers, Moses**, 10-222
- Rogers, Will**, moving-picture production for, 10-\*507
- Rogers, William**, and Massachusetts' name, quotation, 8-176-B
- Rogers, Mount**, peak in Blue Ridge Mountains, 8-418
- Roget, Peter Mark**, article on moving pictures, 10-502
- "Rogue,"** elephant, 4-342
- Rogue novels**, 13-116
  - Cervantes, 13-77
- Rogue River**, Oregon, 8-331
- Rojas, Christobal de**, portrait figure of, 11 \*246
- Roland**, legendary hero, 12-370
  - statue, 14-\*337
- "Roland, Song of,"** French epic, 6-169
  - retold, 14-†337-42
- Roland de la Platière, Marie Jeanne Philipson, Madame**, 6-\*192
- Rolf the Walker**, viking, wins Normandy from France, 6-375, 383
- Rolfe, John**
  - cures tobacco, 7-123
  - marriage to Pocahontas, 12-\*459, 460; 7-122
- Roll** (list), origin of term, 9-273
- Rolled edge**, sewing, 14-†72
- Rolled oats**, breakfast cereal, 9-119; 2-\*124
- Rollin, Chancellor**, portrait by John van Eyck, 11-\*191, 195
- "Rolling Stone, The,"** O. Henry's paper, 13-342

- Rollo**, viking, wins Normandy from France, 6-375, 383
- Rölvaag, Ole**, author, 13-352
- Roman architecture**, 11-†427-38, †61-64
  - aqueducts, 11-\*427, 429; 10 \*535, 537, 538
  - arches, 11-\*61, 62, 64, 427, †428
  - bridges, 11-61,\*437, 438
    - Ponte Margherita, 6-\*315
  - copied by Renaissance, 11-484
  - Etruscan influence, 5-194
  - Forum, 5-\*221, 228, \*231, \*244; 11-†436 fol.; *see also* Forum Romanum
  - fountains, 5-248; 11-188
  - monuments throughout empire, 5 242; 11-62
  - public baths, 5-239, 248; 11 62
  - public buildings, 5-242; 11 62; *see also* Forum Romanum, and names of buildings, as Colosseum
- Roman art**, main article, 11-†59-71
  - compared with Greek, 11-69, 71
  - effect of character upon, 11 64
  - Etruscan influence, 11-62
  - first art collectors, 11 61
  - Greek influence upon, 5-218, \*227; 11 60, 61, \*67
  - influence upon French school, 11 235, 286, 289, 327
  - influence upon Renaissance, 11 108, 110
  - painting, 11-\*57, †69 71
  - portraits and masks, 11-69
  - portraiture, 5 \*247, 11-62, 69
  - realism, 11-69, 71
  - sculpture, 11-60, †64-71, \*107, 108
  - standard for western world, 11-74
  - see also* Roman crafts
- Roman calendar**, 10-481
- Roman Catholic church**
  - and Church of Ireland, 6-145
  - and the Renaissance, 13-82
  - appeal through arts, 11 235
  - art and learning fostered by, 11-84, 88, 90; 5-278, 280
  - Austria, 6-270
  - Canada, 7-12
  - charity, 7-434
  - China, 5 331
  - Christmas and Easter services dramatized, 12 326
  - Counter-Reformation, 6-214, 252, 262
  - England
    - Henry VIII's break with, 6 45
    - under Elizabeth, 6-55, 56
    - under Mary I, 6-48; 12-395
    - under the Stuarts, 6-\*59, \*60, 62, 70, 72
  - Europe, today, 6-162-1)
  - first missionaries in Japan, 5 354
  - France, 6-200
  - Guatemala, 7-43
  - Hapsburgs defenders of, 6-\*261, 263, 271
  - how Greek Orthodox church differs from, 5 275, 407, 408
  - influence on furniture styles, 12-182

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Roman Catholic church** - *continued*

- Ireland, 6-162-B
- struggle, 6-152 fol.
- Italy, 6-294, 315
- Kulturkampf in Germany, 6-232
- Maryland colony a refuge for, 7-130, \*132; 8-158, 159
- Mass
  - Bach's arrangement in B minor, 12-230
  - Palestrina's setting, 12-260
- Mexico, 7-79 fol.
- missions, *see* Missions
- North America, 7-33-N
- only church in Western Europe until Reformation, 6-41
- Portugal, 6-338, 340
- reliquaries, 12-\*21, \*65, 66
- Scotland, 6-116, 120, 121
- South America, 5-518-B
- Spain, 6-319, 327, 334
- Thomas Aquinas' theology, 6-299
- Vatican City, 6-†466-68, 315
- see also* Christianity; Church history; Inquisition; Jesuits; Papacy; Religious orders

**Roman crafts**

- bronze work, 12-\*14, 16, \*17
- carvings, 12-\*94, \*104
- gem carving, 12-105
- history preserved in carvings, 11-64
- furniture, 12-\*178, †179, \*180, 192
- copied by French, 12-192
- glass, 12-†27-29, \*31
- gold and silver work, 12-\*82, 84
- ironwork, 12-\*2, 3
- jewelry, 12-105, 122, †124
- mosaics, 12-†110, 115
- pottery, 12-\*52
- rugs, 12-\*147

**Roman empire**, *see* Byzantine empire; Holy Roman empire; Rome, ancient city and empire

**Roman hyacinth**, 2-\*151

**Roman literature**, 5-242

- biographies, 13-†46-58 (*see also* Contents Volume 13 for list of names)

- Boethius, 13-58
- Cicero, 13-†46-47
- Horace, 13-†49-51
- Livy, 13-†55-56
- Marcus Aurelius, 13-57
- Ovid, 13-†51-52
- Pliny the Elder, 13-†53-54
- Pliny the Younger, 13-54
- Tacitus, 13-†56
- Virgil, 13-†47-48

drama, 12-325

"Golden Age" of Augustus, 5-229; 12-363

**Roman mythology**, *see* Greek and Roman mythology

**Roman numerals**, 10-421, †422

**Roman type**, printing, 10-51

**"Romance of the Rose,"** early French poem, 6-169

**Romance tongues**, 6-162-D

**Romanesque architecture**, 11-450, 452, 454-57

America, 11-512, 515

**Romanesque art**, 11-†86-90

**Romanesque crafts**

- furniture, 12-†182
- jewelry, 12-125

**Romano, Giulio**, tapestry woven by, 12-144

**Romanov, Anastasia**, queen of Ivan IV of Russia, 6-427

**Romanov family** in Russia, rule by, 6-429

**Romansch**, language spoken in Switzerland, 6-254-B

**Romanticism**

- drama, 12-332
- English literature, 6-86; 13-215, 218
- French painters, 11-322-35
- music, 12-†239-46, 282, 290, 306

**Romanticist and classicist**, difference between, 12-243

**Romany language**, 5-390

**Rome**, ancient city and empire, Italy, **description and history**, main article, 5-†189-262

- agriculture, 7-451
- amusement places, 11-438
- aqueduct, 10-\*210, \*535, 537, 538, 11-62, \*63, \*427
- archaeological excavations, 5-\*18, 19
- architecture, *see* Roman architecture
- arms and armor, 10-351, \*352
- army, power of, 5-222, 241, 246
- art, *see* Roman art
- bakeries, public, 9-240
- boats
  - galleys, 5-†211 fol.; 10-\*162, †351; 12-4
  - sailing ships, 10-166
  - sea power, 10-164
- bridges, 11-61, \*437, 438; 10-\*210, 212
- calendar, 10-481
- catacombs, 5-\*251, \*273; 11-75, 440, \*441; 12-\*211
- celebration of New Year's Day, 14-578
- communication and transportation
  - earliest news service, 10-73
  - postal service, 5-242
  - post riders, 10-31, 86
  - roads, 10-†150, \*152; 5-19
  - five roads leading to, 10-31
- crafts, *see* Roman crafts
- festival, spring, 12-\*326
- flags and standards, 14-facing \*572
- forums, 11-438
  - Forum Romanum, 5-221, 226, \*231, \*244; 11-†436-38; 6-\*294
  - "golden milestone," 10-151
  - Trajan's, 11-65
- gladiators, 5-\*234, \*249
- glass making, 12-27-29
- government
  - democracy, 7-348, 353

**Rome, government—continued**

- empire, 7–350
- genius for government and empire building, 5–202, 207, 242; 7–349
- objectives, 11–62
- patricians and plebeians, 5–199
- powerful organization, 5–242
- republic, 5–199
- rule of provinces, 7–349
- senate and assembly, 5–201, 218, 221, 222, 225, 232; 13–46

**histories**

- Livy, 5–229; 13–55
- Tacitus, 13–56

**history, 5–†189–262****birth of a world empire**

- beginnings, 5–198, 204
- defeat of Etruscans, 5–\*189, 192
- Etruscan conquest of, 5–192
- saved when Horatius held bridge, 12–340
- conquest of Italy, 5–205
- farming and farmer-soldiers, 5–208, 246, 248
- menaced by Carthage, 5–208
- the Republic, 5–†190, 201

**Punic Wars with Carthage, 5–†210–17; 10–†353–55**

- subjugation of the Eastern world, 5–217
- uprising and defeat of the people, 5–218, 219
- rule in Spain result of, 6–319

**to end of Augustan Age, 5–†221–29**

- last years of the republic, 5–221–26
- destruction of Corinth, 5–\*181
- occupation of North Africa, 5–454
- domination of world, 5–182
- civilization spread by, 5–270
- conquest of Palestine, 5–129
- conquest of Helvetia, 6–244
- conquest of Gaul, 6–165
- conquest of Egypt, 5–72, 12–361
- Julius Caesar's activities, 12–†356–59
- activities in Britain, 6–\*2 fol., 137
- empire established, 5–222, 226
- men who divided the empire, 5–225
- triumvirate, 5–223, 225; 12–362
- Augustan Age, 5–†226–29; 12–362–63

**first emperors, 5–†231–42**

- map of empire, 5–\*246
- extent of power and art, 5–19; 11–74
- persecution of Jews, 5–133
- Jewish revolt; siege of Jerusalem, 5–133
- burning of Rome, 5–235; 10–336
- early Christians, 5–236, \*273, †274, 275
- Spain ruled by, 6–319
- last great days, 5–241

**decline and fall, 5–†244–54**

- later emperors, 5–244, 248–53
- Christianity established as religion of, 5–253; 12–365

**Rome, decline and fall—continued**

- division into Eastern and Western empires, 12–365; 11–73; *see also* Byzantine empire
  - barbarian invasions, 5–267 fol.; 6–206; 11–452
  - barbarian conquest, 5–†253; 6–293
  - Senators attacked by Gauls, 5–\*202
  - forces that led to downfall, 7–349; 12–363
  - weak spots in Roman state, 5–245
  - see also* rulers, as Augustus; Caesar
  - how emperors became gods, 5–236
  - importance of family, 11–64, 69
  - iron used by, 12–3
  - language, *see* Latin language
  - lead used, 9–418
  - libraries, 10–556
  - literature, *see* Roman literature
  - maps
    - city and vicinity, 6–589
    - empire, 5–246
    - Rome and Carthage, 12–\*355
  - menageries, 4–475
  - methods of storming fortifications, 10–356, \*357, \*358
  - mythology, *see under* Rome, religion
  - navy, 5–\*211, 212, 213; 12–4; 10–\*162, 163 †351
  - oyster beds stocked by, 3–159
  - papyrus used for writing, 9–273
  - patrons, 5–\*245
  - peacocks used by, 4–191
  - people and life in
    - costume, 9–\*7, 8; 12–105
    - head-gear, 9–94
    - sandal, 9–\*58
  - dwelling, 5–228; 11–71; 12–179
  - gem collecting, 12–105
  - love of jewelry, 12–124
  - life, customs, and culture, 5–†226–29, 242
  - luxury and corruption, 5–218, 221, 229
  - magnificence of life in, 5–245, 247; 12–84, 179
  - nature of people: builders, 11–62
  - sports, 5–229, \*234, \*236, \*249
  - spring festival, 5–\*241
- population, 5–245
- religion, 5–253; 11–430; 12–365
- deities, 5–236
  - myths and legends, 14–406, †455–61; 5–204
- religious toleration, 5–273
- respect for Greek culture, 5–218, \*227, 229
- rock from which criminals were hurled, 7–\*349
- slavery, 5–235, 246; 12–179
- taxation, 5–241, 250
- theories of matter, 1–533, 540
- trade, 5–192, 208, 247
- antiques, 11–61
- treatment of conquered peoples, 5–207, 218, 235
- triumphs of conquerors, 5–228

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Rome—continued**

- viaducts, 10-212
- walls, 5-203, 205, 241
- weights and measures, 10-\*370, †373-74
- Rome, medieval city, Italy**
  - art splendor of sixteenth century, 11-158
  - decay, 6-315
  - plundered by Henry IV, 5-296
  - sacked in 1527, 6-302
- Rome, modern city, Italy, 6-\*293**
  - becomes capital of united Italy, 12-446; 6-309
  - French Academy founded, 11-239
  - mandolin manufacture, 12-258-D
  - map, 6-589, 588, D4
  - modern improvements, 6-\*315
  - trade, 10-253
- Rome, N. Y., copper manufactures, 8-281**
- Rome-Berlin axis, 6-315**
- Rome prize (art), 11-239**
- "Romeo and Juliet," drama by Shakespeare, 13-158**
- "Romeo and Juliet," opera by Gounod, 12-308**
- "Romeo and Juliet," symphony by Berlioz, 12-306**
- Römer, Katherine, and sisters, glass etching by, 12-†34**
- Römer, wineglass, 12-†34**
- Romney, George, paintings**
  - "A Lady and Child," painting, 11-\*303
  - "Beaumont Family, The," painting, 11-\*300
  - method of painting portraits, 11-294
- "Romola," by George Eliot, 13-261**
- Romulus, 5-\*196, \*197, \*198, 204**
  - founding of Rome, 5-198, 204
  - nursling of wolf, 12-†18
  - prophecy about Rome, 5-244
  - taking of Sabine women, 5-\*198
- Romulus Augustulus, Roman emperor, 6-293**
- Roncevaux, Battle of, 14-337, 340**
- Rondeaux, songs, 12-216**
- Rondels, songs, 12-216**
- Rondo, musical form, 12-236**
- Ronins, Japanese social class, 5-358**
- Ronsard, Pierre de, life and work, 13-107**
- Röntgen, Wilhelm Konrad von, discovery of X rays, 10-†492**
- Röntgen rays, 10-493**
- "Roof of the world," name for Tibet, 5-438**
- Roofing materials, 9-\*375, 380, 420**
- Roofs**
  - Chinese t'ing, 11-401
  - dirt, in Norway, 6-\*385
  - Greek roof, 11-418
  - Norwegian, 6-†385
  - primitive, 11-395
  - stone, 11-462
  - see also Shelter, thatched
- Rook, chess piece, 14-487**
- Rookeries**
  - birds, 4-\*145, \*200, 202
  - albatros, 4-216
  - Bering Sea, 4-\*206

**Rookeries, birds—continued**

- egret, 4-147
- flamingo, 4-197
- gannet, 4-213
- penguin, 4-\*210
- seals, 4-†327-30, 332
- Roomette, Pullman train, 10-193**
- Roosevelt, Alice (Mrs. Nicholas Longworth), popularity, 12-564**
- Roosevelt, Anna Eleanor (Mrs. Franklin D. Roosevelt), 12-456-E, 467; 2-241, 564**
- Roosevelt, Edith Kermit Carow (Mrs. Theodore Roosevelt), 12-564**
- Roosevelt, Franklin Delano, President of the U. S., life, 12-†555-A-555-D; 12-456-E**
  - appoints women to responsible position, 7-337
  - at National Convention, 7-\*369
  - birthplace, 12-\*555-C
  - domestic policies, 7-†340-343-B
  - portraits, 7-\*341; 12-\*555-A; 6-\*528, \*542, \*545, \*546
  - presidential campaigns, 7-340, 343, 343-B
  - role in World War II, 6-†512 fol.; 12-555-D
- Roosevelt, James, 12-555-A**
- Roosevelt, Nicholas, 7-214**
- Roosevelt, Sara Delano (Mrs. James Roosevelt), 12-555-A**
- Roosevelt, Theodore, President of the U. S., life, main article, 12-†542-4**
  - administration, 7-†305-10
  - attitude toward World War I, 12-546; 7-320
  - builds Panama Canal, 7-306
  - conquest of ill health, 12-543; 2-414
  - conservation of natural resources, 7-309, 310, 311, 467; 2-241
  - curbs big business, 12-544; 7-308
  - dam named for, 10-\*528
  - ends blockade of South American ports, 5-517
  - in Spanish-American War, 7-297
  - personality; made vice president, 7-302
  - portraits, 12-\*542-43, \*545-47; 7-\*307
  - Republican party disrupted by; liberalism, 12-546, 549; 7-311
  - statue, 12-\*542
  - uncle of Anna Eleanor Roosevelt, 12-555-D
- "Roosevelt," Peary's ship, 13-\*493, 500**
- "Roosevelt and the Antinoe, The," poem by Pratt, 13-581**
- Roosevelt Dam, Arizona, 10-\*528, 531; 8-18**
- Roosevelt River (River of Doubt), Brazil, its outflow the Madeira River, length, 10-253**
- Rooster, drawing and mounting, 14-\*69**
- Root cap, structure and function, 2-†36, \*48**
- Roots, of plants, structure and functions, main article, 2-†35-38, \*48**
  - adventitious, 2-\*35
  - aërial, 2-38
  - as storage organs, 2-38
  - bacteria on legume roots, 10-546
  - cross section, 10-\*487; 2-†36
  - edible, 2-38
  - fungi growths on, 2-58

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Roots—continued**

- hairs, 2-36, \*48
- nitrogen on, enriches soil, 2-58, 168
- prop roots, 2-38
- systems, 2-38
- tap root, 2-38
- Roots, of teeth, 2-314, 315**
- Rope and rope making, main article, 9-†282-88**
  - bridges made of, 10-\*209, 210
  - materials used for, 9-291; 10-553
  - esparto grass, 9-\*291
  - fern, 2-92
  - hemp, 5-\*516
  - New Zealand flax, 2-151
  - nylon, for mountain climbing, 14-559
  - Spanish bayonets, 2-151
- Ropewalk, 9-287, 288; 5-\*516**
- Rorqual (finback) whale, 4-\*443, 447**
- Roquefort cheese, 9-348**
- Rosa, Salvator, landscapes, 11-\*185**
- Rosa (rose), 2-183**
- Rosa chinensis, 2-227**
- Rosa gallica, 2-227**
- Rosa sinica, flower, 8-84-A**
- Rosa virginiana, 8-124-A**
- Rosaceae (rose family), 2-162**
- Rosalie, Fort, Miss, 8-201**
- Rosaline, lace, 12-166**
- Rosas, Juan Manuel de, Argentine dictator, 5-514**
- Rose, flower, 2-\*163, 165, 166**
  - attar of, 9-†300-02
  - breeding of, 2-166, 227
  - how they came to be red, 14-442
  - how to make artificial roses, 14-†54
  - members of rose family, 2-\*162, †165
  - New York's state flower, 8-284-A
  - perfume from, 6-\*362, 363; 9-†299-302
  - treatment of seeds, 2-218
  - wild rose, 2-102, \*165, \*227
  - Iowa's state flower, 8-124-A
  - Latin name, 8-124-A
- Rose Bowl game, 8-43**
- Rose-breasted grosbeak, bird, 4-83, \*84, 133**
- "Rose Cavalier, The," opera by Richard Strauss, 12-252, 316**
- Rose chafers, beetles, 3-338**
- Rose City, 8-330**
- Rose-colored glasses, 1-439**
- Rose-crested cockatoo, bird, 4-192**
- Rose point, lace, 12-\*167, 171**
- "Rose-red, Snow-white and," fairy tale, text, 14-†181-83**
- Rose windows, 11-454**
- Roseate spoonbill, bird, 4-147, 148, \*149**
- Roseate tern, bird, 4-204**
- Roses, flowers, see Rose**
- Roses, Wars of the, 6-37, 39**
- Rosetta Stone, 10-\*41, 42; 5-8, 104**
- Rosette, architectural ornament, 11-\*474; 12-182**
- Rosevelt, Claes Martenzen van, 12-555-A**
- Rosewood, 9-258**

**Rosin**

- sources, 9-309
- uses, 9-313; 10-547
- Rospigliosi cup, by Benvenuto Cellini, 12-\*79, 88**
- Ross, Betsy (Mrs. Elizabeth (Griscom Ross)), makes flag for Washington, 14-\*574, 575**
- Ross, Sir James-Clark, explorations, 13-508**
- Ross, John, 13-496**
- Ross, Fort, fur-trading colony, 8-37**
- Ross castle, Ireland, 6-\*160**
- Ross Sea, Antarctica, map, 13-502-B**
- Rossbach, Battle of, 12-419**
- Rossetti, Christina, 13-256**
- Rossetti, Dante Gabriel, biography, main article, 13-†256-57**
  - "Annunciation, The," painting, 11-\*317
  - art, 11-\*317, 319
  - association with Meredith, 13-263
  - Dante and Beatrice, meeting depicted, 13-\*59
  - friendship with Swinburne, 13-259
  - Maiden who bore Holy Grail depicted, 14-\*394
  - painting of "Blessed Damozel," 13-\*257
  - portrait, 13-\*256
  - vogue of the "Rubaiyat" started by, 13-89
- Rossetti, Maria Francesca, 13-256**
- Rossetti, William Michael, 13-256**
- Rossetti family, 13-†256-57**
- Rossini, Gioachino Antonio, composer, 12-251, 253**
  - triangle used by, 12-258-C
- Rostand, Edmond, life and works, main article, 13-137**
  - portrait, 13-\*137
- Rostra, in Roman Forum, 5-\*231**
- Rosy gulls, birds, 4-203**
- Rot, heart, in tree, 2-71**
- Rotary press, 10-\*82**
- Rotary pump, 1-465**
- Rotifera, animalcules, 10-\*490, 14-\*4**
- Rotor ship, 1-\*508**
- Rotta, early German musical instrument, 12-\*226**
- Rotten boroughs, England, 6-93, 94**
- Rotten Row, Hyde Park, London, 6-\*94**
- Rotterdam, Holland, 6-355**
  - map, 6-592, C3
- Rouen, France, Joan of Arc put to death at, 6-175**
- Rouget de Lisle, Claude, 12-†242**
- Rough Riders, 12-†544; 7-296**
- Roughage, in diet, 2-367**
- "Roughing It," by Mark Twain, 13-329, 330**
- "Roughing It in the Bush," by S. Moodie, 7-29-I**
- Roumania, description and history, country, Europe, 6-368-A, †360-62**
  - agriculture, 6-368-A, 360
  - area, 6-368-A
  - climate, 6-368-A
  - fascist power in, 6-241
  - flag, color plate, 14-following 570, no. 57
  - government, 6-368-B
  - invasion of Hungary, 6-290

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Roumania—continued**

- location, 6-368-A
- maps, 6-595
  - on map of Europe, 6-571
- people, 6-368-B, \*361-62
- physical features, 6-368-A
- products, 6-368-A-368-B, oil, 6-360
- provinces, 6-368-B
- rivers, 6-368-A; 10-259
- trade, 6-360
- wins freedom from Turkey, 5-414; 6-362
- see also* index preceding article on World War II, 6-493

**Round angle**, geometry, 10-438

**Round peg**, how to make, 14-†27

**Round steak**, 9-†328

**Round Table**, **Knights of the**, stories retold, 14-†377-404

- best known versions, 14-378

- Malory's, 13-†145-46

- coming of Arthur; his Round Table, 14-†377-82

- Gareth, 14-†387-92

- Geraint, 14-†383-86

- last story of Arthur, 14-†399-404

- Morgan le Fay, 1-425

- quest for Holy Grail, 14-†393-98

- see also* Arthur, legendary British king

**Round window** of cardrum, 2-303

**Roundheads**

- In English Civil War, 6-64

- name for Puritans, 12-406

**Rounds**, musical form, 12-213

**Rousseau, Henri**, art style, 11-\*390, 392

- tropical scene, 11-\*390

**Rousseau, Jean Jacques**, life and works, main article, 13-17-19

- influence, 6-252

- portrait, 13-\*17

**Router**, cutting machine, 10-\*69

**Rove beetle**, 3-337

**"Rover, The,"** by Joseph Conrad, 13-274

**Rovers**, nickname for people of Colorado, 8-52-B

**Rowboats**, 14-531

**Rowing and boat races**, main article, 14-†530-33

**Rowland, Mrs. Dunbar**, song by, 8-206-A

**Rowlands, John**, original name of Sir Henry Morton Stanley; *see* Stanley

**Rowley, Thomas**, imaginary monk, 13-204

**Rowlock**, of a boat, 14-531, 532

**Roxana**, wife of Alexander the Great, 12-349

**"Roxana,"** by Daniel Defoe, 13-177

**Roxas, Manuel A.**, President of Philippines, 5-568-A

**Roxy Theater**, R.K.O., New York, 11-\*510

**Roy, Jean**, thermometer of, 1-390

**Royal Academy**, England, 11-298

- Benjamin West president, 11-354

**Royal Academy**, France

- founded, 11-234

- opposition to original artists, 11-328, 329, 337, 340

- places art in hands of the king, 11-239

**Royal Academy—continued**

- style approved by, 11-286, 290

- type of paintings shown, 11-283, 324, 337

**Royal antelope**, 4-413

**Royal Canadian Air Force**, 7-29-D

**Royal Canadian Mounted Police**, 7-24, 33-I; 13-\*569

**Royal College of Surgeons**, England, 13-359

**Royal Copenhagen pottery**, 12-\*60

**Royal Exchange**, London, 6-\*77

**Royal Geographical Society**, London, African Association combined with, 5-453

**Royal Institution**, amphitheater, 13-\*386

**Royal jelly**, food of queen bee, 3-312, 314

**Royal Museum**, Alexandria, Egypt, 5-181

**Royal palms**, 2-\*149, 150; 9-189

- Cuba, 7-60

**Royal prerogative** 7-160

**Royal Society**, London

- founding, 6-72

- Sir Isaac Newton president of, 13-401

- study of bacteria, 13-363

**Royal Standard** of British sovereigns, color plate, 14-facing \*572

**Royal University**, Mexico City, 7-79

**"Royal William,"** steamboat, 10-222

**Royal Yacht Squadron** of England, 14-528

**Royalty**, special costumes, 9-5

**Rozier, Jean François Pilâtre de**, *see* Pilâtre de Rozier, Jean François

**Ruapehu**, volcano, New Zealand, 5-541-B

**"Rubaiyat of Omar Khayyam,"** 13-89

**Rubber**, main article, 9-†260-71 B

- Akron, Ohio, a manufacturing center, 8-312; 9-271-B

- elasticity, 9-261

- forest, South America, 5-\*496

- guayule bush produces, 7-87-B

- hard rubber a heat insulator, 1-396

- melting point, 1-\*392

- Ohio dependent upon East Indian supply, 7-578

- scrap drive, 6-\*531

- synthetic, 9-271, 271-A, 271 B; 10-545

- uses: products made from, 9-\*260, 262, 268, 269; 9-271-B

- vulcanized, 9-\*260, 268

- waterproofing, 9-261, 268, 269

**Rubber nipples**, effect upon babies, 2-312

**Rubber vine**, 9-\*262

**Rubens, Peter Paul**, life and art, 11-†218-27

- appearance and manner, 11-220

- as ambassador, 11-220, 225, 226

- character, 11-219, 223

- designs for jewelers, 12-125

- in his studio, 11-\*218, 223

- Luxembourg paintings for Marie de' Medici, 11-\*221, 224

- opinion of Spanish art, 11-247

- paintings, 11-\*269-76

- "Garland of Fruits, The," 11-\*217

- Lot's family escaping from Sodom, 11-\*220

The asterisk (\*) refers to picture and its explanation only The obelisk (†) refers to illustrated text.

**Rubens, paintings---continued**

- Marie de' Medici leaving boat at Marseilles, 11-<sup>\*</sup>221  
 of himself with wife in garden, 11-<sup>\*</sup>224  
 "Peasant Dance," 11-<sup>\*</sup>222  
 portrait of first wife, 11-<sup>\*</sup>219  
 portrait of second wife, 11-<sup>\*</sup>223  
 St. Ignatius of Loyola, 13-<sup>\*</sup>545  
 self-portraits, 11-<sup>\*</sup>218, <sup>\*</sup>224  
 paintings in Antwerp Cathedral, 6-346  
 responsible for Rococo style, 11-280  
 tapestry designs, 12-142  
 Watteau inspired by, 11-281  
 wives, Isabella Brant, 11-<sup>\*</sup>219, 222; Helen Fourment, 11-<sup>\*</sup>223, <sup>\*</sup>224, 227  
**Rubicon**, river, Caesar crosses, 12-<sup>\*</sup>356, 358  
**"Rubicon, Crossing the,"** origin of term, 5-224; 12-358  
**Rubidium**, element, symbol, atomic no. and wt., 1-<sup>\*</sup>551  
**Rubies**, color plate, 9-frontispiece, 431  
 how to make a green ruby, 9-432  
**Rubinstein, Anton**, life and music, main article, 12-311-12  
 portrait, 12-<sup>\*</sup>311  
 quoted, 12-245  
**Rubinstein, Nikolai**, 12-312  
**Rubio, Ortiz**, president of Mexico, 7-87  
**Ruby**, *see* Rubies  
**Ruby-crowned kinglet**, bird, 4-224  
**Ruby-throated humming bird**, 4-<sup>\*</sup>29, †30  
 late visitor, 4-224  
**Ruckstuhl, F. W.**, statue by, 11-<sup>\*</sup>375  
**Rudbeckia hirta**, flower, 8-162-B  
**Rudder**, airplane, 10-<sup>\*</sup>328-K  
**"Ruddigore,"** by Gilbert and Sullivan, 12-320  
**Ruddy duck**, 4-119  
**Rude, François**, sculpture, 11-†291  
**"Rudin,"** by Ivan Turgeneff, 13-93  
**Rudolph I**, Holy Roman emperor, king of Germany, 6-259-60  
 acquires Austria, 6-260  
 elected ruler of Germany, 6-259  
**Rudolph II**, Holy Roman emperor and king of Hungary  
 and Bohemia, 13-<sup>\*</sup>388  
 and Counter-Reformation in Austria, 6-262  
**Rudolphine Tables**, catalogue of stars, 13-399  
**Ruebush, Will H.**, song by, 8-418-A  
**Ruff**, bird, 4-<sup>\*</sup>114  
**Ruffed grouse**, bird, 4-<sup>\*</sup>77, 78  
 Pennsylvania's state bird, 8-342  
**Ruffed lemur**, 4-†268  
**Rufous-necked hornbill**, bird, color plate, 4-<sup>\*</sup>185  
**Rufy, Raoul**, paintings, 11-390  
**Rugby**, England, transoceanic transmitting station, 10-121  
**Rugby, school**, England, Matthew Arnold's masters at, 13-254  
**Rugs**, main article, 12-†146-61  
 braided, how to make, 14-†77  
 cleaning of, 12-161

**Rugs- continued**

- Caucasian, 12-<sup>\*</sup>146  
 grave rugs, 12-148  
 hooked, 12-<sup>\*</sup>157  
 how to make, 14-†79  
 largest in world, 12-<sup>\*</sup>156  
 machine-made, 12-†159-61  
 Navajo Indian, 12-†140  
 oriental, 12-146, †148-57  
 Chinese, 12-150, †155-56  
 Egyptian, 12-<sup>\*</sup>148, <sup>\*</sup>150  
 materials used in, 12-156  
 of Turkestan, 5-435  
 Persian, 12-148, 150, <sup>\*</sup>153  
 symbolism, 12-150, 157  
 Turkish, 12-148, <sup>\*</sup>149, <sup>\*</sup>151  
 prayer rugs, 12-148, <sup>\*</sup>149; 5-†417  
 tapestry, 12-158, 161  
 weaving, 10-344, <sup>\*</sup>345  
*see also* Carpets  
**Ruhr Valley**, Germany  
 French occupation, 6-202  
 Krupp ironworks, 10-256  
**Ruins**, *see* Archaeology  
**"Rule of Saint Augustine,"** 13-533  
**Rumania**, *see* Roumania  
**Ruminants**, animals, 4-403  
 hollow-horned and solid-horned compared, 4-415, <sup>\*</sup>421, <sup>\*</sup>423  
**Rump Parliament**, England, 6-68; 12-409  
**Rump roast**, amount from steer, 9-328  
**"Rumpelstiltskin,"** fairy tale, text, 14-†227-29  
**Rumsey, James**, 10-220  
**Run, sheep, run**, game, 14-173  
**Runeberg, Johann Ludwig**, battle poems by, 6-456  
**Runes** (writing), 6-†374  
 Iona, 6-488  
 Scandinavia, 6-†374  
**Runic stone**, 6-<sup>\*</sup>374  
**Runners**, *see* Couriers  
**Runners**, of plants, 9-157  
**Running**, sport, 14-471, †472-76  
**Running stitch**, sewing, 14-†72  
**Running the gauntlet**, Indian ordeal, 7-106  
**Runnymede**, England, Magna Charta signed at, 6-<sup>\*</sup>18, 24  
**Rupe Tarpeia**, Rome, 7-<sup>\*</sup>349  
**Rupert III**, Holy Roman emperor, 6-211  
**Rupert, Prince**, at Marston Moor, 6-<sup>\*</sup>65  
**Rupert's Land**, sold to Canada, 7-23  
**Rüppell's vulture**, bird, 4-<sup>\*</sup>160  
**Rural Free Delivery service**, 10-91  
**Rurik**, viking explorer, 6-375, 424  
**Ruschuk**, Bulgaria, port on Danube, 6-269-A  
**Rush-Bagot Convention**, 7-15  
**Rushes**, plants, 2-148  
 used for floor covering, 12-158  
 used in medieval castles, 5-305  
**Rushmore, Mount**, S. D., National Memorial, 8-361, 364-A; 11-<sup>\*</sup>361, 366

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Ruskin, John, life and works, main article, 13-**  
 †236-38  
 defense of 'Turner's art, 11-314  
 portrait, 13-†237  
 Whistler's suit against, 11-320  
**Russell (Lord), John, earl, 7-16**  
**Russia, country, Europe and Asia, main article,**  
 6-†422-43; general data, 6-443-A  
 agriculture, 6-366, 367, 368, \*440, 443  
 barley, 9-120  
 beet sugar production, 9-126  
 collective farming, Russia, 6-442  
 flax, 9-47  
 hemp grown, 9-285  
 irrigation, 10-533  
 oats raised, 9-119  
 rye produced, 9-119  
 tobacco, 9-223  
 wheat, 9-98  
 animal life: wolves, 4-299  
 area, 6-443-A  
 army and navy organized, 6-429, 430  
 art, 11-392  
 bear-baiting, 6-425  
 Christianity forced upon, 6-425  
 church made independent, 6-428  
 cities and rivers, 10-260-62  
 climate, 6-443-A  
 common people  
   favored by Ivan the Terrible, 6-422, 427  
   reduced to serfdom, 6-428  
   reign of Alexander I, 6-434  
   secret societies: oppression by Nicholas I,  
     6-435  
   serfs freed by Alexander II, 6-436  
   unrest: revolution, Soviet government, 6-  
     436-43  
 communism, 7-551  
 constitution, 6-443  
 Cossacks, 6-367, \*427, 428  
 dams, 10-261-62; 6-440, \*522  
 divisions, 6-443-B  
 education, 6-443  
 established Eastern church, 6-425, 428, 430; 5-  
   275  
 famine of 1921, 6-367  
 Five-Year Plan, 2-442  
 foreign relations, 6-443  
 forest zone, 6-443-A  
 German soldiers in Russian winter, 6-\*520  
 government, 6-443-B, 442-43  
 guerrilla fighters, World War II, 6-\*523  
**history, 6-†422-30**  
   to 1762  
     first appearance of name, 6-424  
     under Scandinavian chiefs, 6-424  
     Mongol occupation, 6-426  
     divided by civil wars, 6-425  
     princes become grand dukes, 6-426  
     first czars, 6-427  
     under Ivan the Terrible, 6-427  
     Siberia made part of, 6-427

**Russia, history, to 1762—continued**  
 relations with Poland, 6-450, 451, 454  
 Romanov rule, 6-429  
 title "Emperor" first used, 6-430  
 under Peter the Great; modern reforms,  
   12-414-15; 6-430  
 seven decades of queens, 6-430  
 wars with Sweden, 6-403, 406, 407  
 under Catherine the Great; 12-†416-17;  
   6-433  
**1762 to date, 6-†432-43**  
 partition of Poland, 6-451, 452, 454  
 Finland made subject to, 6-407, 456  
 wins Aland Islands from Sweden, 6-407  
 Napoleonic Wars, 6-226, †435; 12-\*427,,  
   †430  
 Crimean War, 6-98, 436  
 advance into Turkey, 5-413  
 power curbed by Congress of Berlin,  
   6-232  
 rule of Russian Turkestan, 5-435  
 relations with Austria-Hungary, 6-273  
 Triple Entente, 6-438  
 relations with Japan, 5-364  
 Russo-Japanese War, 6-437; 5-364  
 Portsmouth peace conference, 7-307  
 World War I, 6-236, 237, 438  
 Czar opposes Duma: abdicates, 6-438, 439  
 Treaty of Brest-Litovsk, 6-439  
 Baltic countries lost by, 6-459, 462 fol.  
 Bessarabia given to Roumania, 6-360  
 Revolution of 1917, 6-\*437, 439  
 under Soviet government, 6-435-43  
 treaties against Germany, 6-241  
 Stalin's dictatorship, 6-442-43  
 Ice Age, 1-61  
 industry, 6-443; *see also below* products and in-  
   dustries  
 irrigation, 10-261  
 Jews in, 5-138; 12-311  
 Kremlin, Palace of the, 12-\*449-D  
 language, *see* Russian language  
 Library, Soviet, in Leningrad, 10-560  
 literature, *see* Russian literature  
 location, 6-443-A  
 maps, 6-601, 602  
   arctic regions, 13-502-A  
   on map of Asia, 5-580  
   on map of Europe, 6-571  
   territory acquired from 1462 to date, 6-\*424  
 music and musicians, 12-254, †311, †312, 314  
 New World interests  
   Alaska, 8-11  
   California, 8-37  
   Idaho claimed, 8-88  
 peasant house, 11-\*398  
 people, 6-443-A  
 physical features, 6-443-A  
 possessions, Asiatic, 5-336-D  
 products and industries  
   coal, 6-368; 9-438  
   fisheries, 9-366

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

**Russia, products and industries—continued**

- furs, 6-428 \*
  - lumber, 9-257
  - metals, 9-393, 408, 418, 422
  - oil supply, 6-368
  - peat, 9-438
  - petroleum, 9-453
  - phosphates, 1-97
  - resources, 6-366 fol., 428, 438
  - salt, 9-412
  - see also* Russia, agriculture
  - racial origin of people, 6-423
  - religious situation, 6-443; 7-556
  - rivers, 10-258, 260-63; 6-368, 443-A
  - serfdom, 6-428, 434, 436; 13-92
  - size, 6-423, \*424
  - Slavic tongue, 6-443-A
  - steppes, 6-367
  - theater, 12-333, 334
  - trade, 6-439, 441
    - beginning of trade with England, 13-472
    - China, 5-330, 333
    - fur trade, 6-424
    - Japan, 5-354, 357, 361
    - merchant marine, number, 10-232
    - transportation of goods, 10-261 fol.
    - turkey export, 9-359
  - trade routes, 6-368, 43; 12-415
  - transportation, 10-260-63
    - water, 6-368
  - uncivilized manners, 6-433
  - Viking settlements, 6-393
  - wolves, 6-\*423
  - see also* Azerbaijan, Georgia; Ukraine; Union of Soviet Socialist Republics, and index
  - World War II, 6-493
- Russia leather**, 9-72
- Russian America**, 8-116 B
- Russian-American Company**, 8-11
- Russian art**, native, 11-392
- Russian language**, 6-423
- alphabet, 10-45
- Russian literature**, main article, 13-†90-97
- biographies, 13-†90-97

**Russian literature, biographies—continued**

- Andreyev, 13-96-97
- Dostoyevsky, 13-93-95
- Chekhov, 13-95-96
- Tolstoy, 13-†90-92
- Turgeneff, 13-92-93
  - first short stories published, 13-95
- Russian thistle, seed dispersal, 2-212
- Russian wolfhound, dog, 4-\*490
- Russo-Japanese War, 6-437; 5-364
  - use of wireless in, 10-116
- Rust, John and Mack, cotton picker machine, 8-\*204
- Rust (iron oxide), 1-96
- Rust, plant disease, 2-140, 9-100
- Rustenburg Transvaal, industries, 5-490
- Rustlers, cattle, 9-320
- Rusty grackle (blackbird), 4-46, 101
- Rutgers University, 8-251
- Ruth, George Herman (Babe), baseball player, 14 \*503
- Ruthenians, ancestors of Ukrainians, 6-367
- Ruthenium, element, symbol, atomic no. and wt., 1-\*551
- Rutherford, Sir Ernest, electron theory, 1-284
- Rutland, Vt., 8-403
- Rutland County, Vt., 8-403
- Rutledge, Edward, conference with Lord Howe, 12-\*479
- Rutledge, John, Constitution of the United States, 12-496
- Ruwenzori Mountains, Africa, 5-462
  - height, 1-29
  - map, 5-575, 1.8
- "Ruy Blas," musical composition by Mendelssohn, use of trombone, 12-258 B
- "Ruy Blas," by Victor Hugo, 13-226
- Ruy Lopez, chess play, 14-489
- Ruysdael, Jacob van, paintings, 11-†270
  - "The Mill," painting, 11-\*270
- Rydal Mount, England, Wordsworth's home, 13-†216
- Ryder, Albert, life and art, 11-370
- Rye, 9-119
- Ryswick, Peace of, 6-184



**Saarinén, Eliel**, 11-519

**Saba**, ancient kingdom, Arabia, 5-394

**Sabbath**

- observance in colonial New England, 7-150
- origin as Christian day of rest, 5-\*382

**Sabella worm**, 3-\*118, 120

**Saber-toothed cats**, 3-52

**Saber-toothed tiger**, 3-54, \*55

- tooth, 2-314

**Sabine-Neches Waterway**, 8-386

**Sabine River**, U. S., in Louisiana and Texas

- Louisiana, 8-146; Texas, 8-386

**Sabine River Works**, Texas, chemicals, 8-\*383

**Sabine women** taken by the Romans, 5-\*108

**Sabines**, killing of Tarpeia, 7-349

**Sable**, antelope, 4-\*415, 416, \*421

**Sable**, type of weasel, 4-357

**Sabotage**, in World War II, 10-364

**Sac**, Indian tribe, *see* Sank

**Sacajawea**, Indian guide, 13-\*491, 492

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



- Saccharine**, sweetening substance, 9-445  
**Sachs, Hans**, 12-217  
**Saco, Maine**, founding of, 8-152  
**Saco River**, New Hampshire and Maine, 8-156  
**Sacral nerves**, 2-\*393  
**Sacramento**, capital of Calif., 8-\*33  
     capitol building, 8-\*33  
     industry, 8-39  
**Sacramento River**, Calif., 8-38, 42, 42-A  
     conservation project, 8-43  
     Shasta Dam, 8-40; 7-\*469  
**"Sacred and Human Love,"** by Titian, 11-\*179  
**Sacred animals**, *see* Animals, sacred  
**Sacred books**, *see* Bible; Koran; Talmud  
**Sacred ibis**, bird, 4-148  
**Sacred lily of Africa**, 2-\*183  
**Sacred music**, *see* Music, sacred  
**Sacred numbers**, 10-421  
**Sacrifice, animal**, by Romans, 5-202  
**Sacrifice, human**  
     Aztec, 7-71 fol., 91  
     Fiji Island, 5-527  
     Neolithic man, 5-40  
**"Sad Shepherd, The,"** play by Ben Jonson, 13-164  
**Saddle**, in physiography, 1-25  
**Saddle bats** or window, 12-176  
**Saddle-billed stork**, 4-\*195  
     color plate, 4-\*184  
**"Sadko,"** opera by Rimsky-Korsakov, 12-313  
**Safe-deposit boxes**, 7 \*522  
**Safety devices**, fuses, 1-524  
**Safety education**, *see* Public safety  
**Safety engineer**, 2-425  
**Safety lamps**, for coal miners, 13-†383-84; 9-442  
**Safety pin**, Etruscan, 12-\*122  
**Safety valve**, 10-397  
**Saffron leaves**, yellow dye from, 12-157  
**Saga**, Bjornson's attempt to create a new, 13-98  
**Saga of the Volsungs**, 14-310; 6-420  
**Sagas**  
     Icelandic, 6-420; 14-310  
     Scandinavian, 6-374  
**Sagasta, Praxedes Mateo**, 6-334  
**Sage**, plant, uses, 9-310, 311  
**Sage grouse**, 4-\*95, 96  
**Sage hen**, 4-\*95  
**Sage Hen State** (Nevada), 8-234-B  
**Sage Hens**, people of Nevada, 8-234-B  
**Sage lily**, 8-396-A  
**Sage of Concord**, name for Emerson, 13-303, 305  
**Sage of the Curtain**, name for Confucius, 13-514  
**Sage State** (Nevada), 8-234-B  
**Sagebrush**, plant, 8-234-B  
**Sagebrush State**, nickname for Nevada, 8-234-B  
     Wyoming, 8-454-A  
**Sagger**, fire-clay box, 12-44, \*45  
**Saghalien**, *see* Sakhalin  
**Sagittarius** (Archer), constellation, 1-178  
     star maps  
     July and August, 1-178-H  
     Sept. and Oct., 1-178-J  
**Sago palm**, 2-99; 9-191  
**Saguache Range**, Col., 8-52-A  
**Saguara**, Arizona's state flower, 8-24-A  
**Saguaro National Monument**, Ariz., 8-24-A  
**Saguenay River**, Quebec, Canada, length, 10-253  
**Saguntum**, city, Spain, siege of, by Hannibal, 12-353  
**Sahama, Mount**, in Bolivia, 5-518-D  
**Sahara**, or **Great Desert**, Africa, description, 5-473-A, †451, 452-53  
     animals, 5-453  
     Barbary Coast, the green girdle of, 5-451  
     exploration of, 5-453  
     humidity, relative, 1-393  
     lack of rainfall, 5-444  
     maps, 5-574  
     name, meaning of, 5-452  
     salt oases, 9-412  
     windy, 1-231  
**Sahel**, region, Africa, 5-452  
**Sahuaro** (giant cactus), size, 2-†252  
**Saiga**, antelope, 4-422  
**Saigon**, Indo China, 5-430  
     rainfall and temperature, 5-430-B  
**Sail** to aid skating, how to make, 14-†44  
**Sailboats**, earliest, 10-140  
     of Peter the Great, 6-429  
     *see also* Sailing; Sailing ships  
**Sailfish**, 3-\*212, \*214  
**Sailing**, main article, 14-†527-30, 10-160  
**Sailing ships**, main article, 10-†158-73  
     cargoes, 7-573  
     present day use, 10-238-40, 242  
     *see also* Sailboats  
**Sailors**  
     Dutch, 6-\*353  
     Phoenician, 5-109  
     weather forecasting, 1-266  
**Sails**  
     basket, 12-\*130  
     earliest, of skin, 10-160  
     names of, on square-rigged merchant vessel, 10-†171  
**Saint**  
     in medieval art, 11-94  
     pilgrimages to shrines of, 11-90  
     *for facts concerning individual saints see name of saint, as Francis, John, etc.; all place names (rivers, cities, mountains, etc.) and names of churches and paintings preceded by St. are listed below*  
**Saint, Thomas**, invents sewing machine, 10-443, \*444  
**"St. Agnes,"** painting by Andrea del Sarto, 11-\*166  
**"St. Agnes, The Eve of,"** by Keats, 13-231  
**St. Albans, Viscount**, *see* Bacon, Francis, Baron Verulam

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- St. Andrew**, cross of, 14-573  
color plate, 14-facing \*572
- St. Andrews University**, founded, 6-118
- St. Ann's Bay**, Jamaica, settled by Diego Columbus, 7-54
- St. Anne**, fort of, 8-399
- St. Anthony**, church, Padua, 11-\*449
- St. Anthony**, Falls of, in Minn., 8-193  
discovery, 8-191  
water power furnished by, 8-196
- St. Apollinare**, church of, Ravenna, carvings, 11-\*76
- St. Augustine**, Fla.  
fort built by Spanish, 8-69  
Fort Marion, 7-†411; 8-76-A  
founded, 7-119  
plundered by Drake, 12-405
- St. Bartholomew's Day**, 6-\*175, 177
- St. Bernard dogs**, 4-\*490, 501
- St. Catherine's wheel**, fireworks, 13-527
- St. Charles Air Line Bridge**, Chicago, 10-\*211
- Saint Cloud**, France, porcelain, 12-59
- St. Cloud**, Minn., industries, 8-196
- St. Croix**, Nova Scotia, first settlement, 7-3
- St. Croix**, or **Santa Cruz**, island of West Indies, 7-62; 8-467
- St. Croix Island**, in Saint Croix River, early colony, 8-151
- St. Croix River**, between Maine and New Brunswick, 8-156
- St. Croix River**, Wisconsin, 8-446  
lumbering on, 9-246, 254  
Minnesota, 8-198
- St. David's school and cathedral**, Wales, 6-137
- St. Denis**, France, abbey, 11-460
- St. Elias Range**, North America, 8-16
- "**Saint Francis Comforted by an Angel**," painting, 13-\*529
- St. Francis Lake**, U. S., 8-30-A
- St. Francis River**, U. S., 8-30-A, 212-A
- St. Francis Xavier University**, Nova Scotia, 7-29-N
- St. Francois Mountains**, U. S., 8-212-A
- Saint-Gaudens**, **Augustus**, 11-364  
association with Stanford White, 11-364  
sculptures, 11-\*352, \*358-59, 364  
figure from Adams Memorial, 11-\*352  
Lincoln, statue of, 11-\*359  
Shaw Memorial, 11-\*358  
use of bronze, 12-24
- Saint-Gaudens**, **Louis**, carving, 11-364
- St. Geneviève**, first French settlement in Missouri, 8-208
- Saint Geneviève's grotto and meadow**, 12-367
- St. George**, capital of Grenada, 7-66
- St. George**, cross of, 14-573  
color plate, 14-facing \*572
- "**Saint George**," statue by Donatello, 11-†128, \*129
- St. George's Channel**, British Isles, maps, 6-573, 577
- St. George's Day**, 14-573
- St. Gotthard railway**, 10-256
- St. Gotthard tunnel**, 10-204
- St. Helena**, island, So. Atlantic Ocean, 6-491  
Napoleon banished to, 12-432  
port of call for English ships, 5-477  
tides, 1-134, 137
- St. Joe National Forest**, Idaho, tree planting, 2-\*243
- St. John**, capital of Antigua, West Indies, 7-64
- St. John**, island, West Indies, 7-62; 8-467
- St. John, Knights of**, in Malta, 5-\*282
- St. John River**, North America  
length, 10-253  
Maine, 8-156  
map, 7-593
- St. John the Divine**, cathedral, New York City, 11-\*521  
granite pillars, 8-151  
window, 12-\*76
- St. John's**, capital of Newfoundland, 7-\*31, 32  
rainfall and temperature, 7-29-N, 33-A  
map, 7-593
- St. John's Church**, Richmond, Va., 12-\*483
- St. John's Hospital**, Bruges, Floreins Altar, 11-\*196
- St. Johns River**, Florida, 8-76
- St. Johnsbury**, Vt., manufacturing, 8-402
- St. Joseph River**, Michigan and Indiana, 8-116
- St. Joseph River**, Michigan and Ohio, 8-116
- St. Kitts**, island, West Indies, 7-363
- St. Laurent**, **Louis S.**, Canadian statesman, 7-29-B; portrait, 7-\*33-F
- St. Lawrence**, **Gulf of**, Canada  
common starfish, 3-133  
explored by Cartier, 7-135  
maps, 7-593, 590
- St. Lawrence Islands**, national park, 7-29-Q
- St. Lawrence River**, North America, 8-283  
basin area, 10-257  
Canada, 7-33-A, \*29-P  
Cartier's discovery, 13-†474; 7-3  
development as waterway, 1-370; 10-267  
exploration, 13-481  
length, 10-253  
maps, 7-593, 595
- St. Lazaria Bird Refuge**, 8-16-B
- St. Lorenzo**, cathedral, Florence, pulpit by Donatello, 11-129
- St. Louis**, Mo.  
industries, 8-212; 9-236  
settlement, 8-208  
reason for, 8-97  
temperature, 8-212 A  
Union Station, railroad terminus, 8-212
- St. Louis, Fort**, built by La Salle, 7-\*137; 8-96
- St. Lucia**, island, West Indies, description, 7-66  
map, 7-601, G4
- "**St. Luke Making a Portrait of the Virgin**," painting by van der Weyden, 11-\*198
- St. Luke's Church**, Isle of Wight County, Virginia, 11-\*497, 499
- St. Maclou**, church, façade, 11-466

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Saint-Malo**, France, sailors of, 13-473  
**St. Mark**, Lion of, Venice, 11-\*497  
**St. Mark's**, cathedral, Venice, 11-†446-49, \*455; 10-\*75  
 altar cover, 12-88  
 bishop's throne, 12-\*181  
 bronze horse, 11-\*81  
 campanile, 11-\*455  
 capital, 12-\*94  
 mosaics, 12-\*111, 112; 11-\*78, 81  
 Pala d'Oro, Byzantine altarpiece, 11-\*447; 12-66, 88  
 pigeons, 6-\*312  
**St. Mark's, Library of**, Venice, 11-\*455  
**St. Mark's**, monastery, Florence, 11-\*483  
**St. Marks Migratory Bird Refuge**, Florida, 8-76-A  
**St. Martin**, island, West Indies, description, 7-63  
 map, 7-601, G3  
**St. Martin's Church**, Canterbury, 6-9  
**St. Mary**, Church of, Rome, mosaics, 11-77  
**St. Mary in Aracoeli**, church, Rome, 5-\*275  
**St. Mary of Bethlehem**, priory, London, 10-21  
**Saint Mary of the Arena**, chapel, Padua, Italy, paintings, 11-116  
**St. Mary Redcliffe**, church, Bristol, England, 13-\*204  
**St. Mary's City**, Maryland, site of early settlement, 8-158  
**St. Mary's River**, Montana, U.S., and Alberta, Canada, 8-220  
**St. Marys River**, Florida and Georgia, 8-76  
**St. Matthew Passion**, Bach's, 12-230, 288  
**"St. Maurice and His Theban Legion,"** painting by El Greco, 11-\*245, 246  
**St. Maurice River**, Quebec, Canada, tributary of St. Lawrence, length, 10-253  
**St. Michael Island**, Alaska, 8-16  
**St. Michel**, church, Bordeaux, bell tower of, 11-\*461  
**St. Moritz**, Switzerland, winter sports, 14-521, \*524  
**St. Nicholas**, legends about, 14-580  
**St. Ouen**, church, Rouen, France, 11-466  
**St. Patrick**, red cross of, 14-573  
 color plate, 14-facing \*572  
**St. Patrick's Day**, 14-570  
**St. Paul**, Minn., 8-\*191, 196  
 capitol, 8-\*189  
 first settlers, 8-193  
 longest day, 1-202  
 temperature, 8-198  
**"St. Paul,"** oratorio by Mendelssohn, 12-245, \*298  
**St. Paul Outside the Walls**, church, Rome, 11-\*456  
**St. Paul's**, cathedral, London, 11-\*492, 493  
 inscription on door, 8-186-B  
 wood carving, 12-107  
**St. Paul's Gate**, Rome, 11-\*437  
**St. Peter's**, church, Rome, plans and construction, 11-†484, \*485, \*486  
 Byzantine chair, 12-181  
 column, 12-\*94  
 dome, 11-†484, \*485  
 the work of Michelangelo, 11-162  
 sculpture by Michelangelo on, 11-\*161  
**St. Peter's Fort**, Miss., early settlement, 8-201  
**St. Peter's Street**, New Orleans, 8-\*143  
**St. Petersburg**, Russia, *see* Leningrad  
**St. Petersburg Conservatory of Music**, 12-312  
**St. Pierre**, isl., Gulf of St. Lawrence, 7-33-N  
**St. Pierre**, Martinique, destroyed, 7-64  
**St. Prudentiana**, church, Rome, mosaic, 11-77  
**St. Rocco, Brotherhood of**, paintings for, 11-186  
**Saint-Saëns, Camille**, 12-253  
**St. Sebastian**, church, Rome, catacombs, 11-\*75  
**St. Sebastian**, fort, storming of, 6-\*87  
**St. Sophia**, mosque, Constantinople, 11-81, \*445, 446; 5-†405  
**St. Swithin's Day**, 1-267  
**St. Thomas**, one of Virgin Islands, West Indies, description, 7-62; 8-467  
**St. Thomas**, seaport, Virgin Islands, *see* Charlotte Amalie  
**St. Trophime**, church, Arles, France, carvings, 11-88, \*89  
**St. Valentine's Day**, 14-579, \*581  
**St. Vincent**, island, West Indies, 7-\*65, 66  
**St. Vincent, Cape**, Portugal, battle at, 12-405, \*420, 421  
**St. Zeno**, church, Verona, 11-452  
**Ste. Anne de Beaupré**, church, Quebec, 7-\*29-R  
**Sainte Chapelle**, chapel, Paris, 11-465  
**"Saints,"** nickname for people of Utah, 8-396-A  
**Sais, Egypt**, government at, 5-69  
**Saitic period** of Egyptian history, 5-70  
**Sakai**, primitive Malaysians, 5-426  
**"Sake,"** derivation and changes in meaning of term, 10-25  
**Sakhalin**, island, Sea of Okhotsk, 6-443-A  
 map, 5-502  
**Sakonnet River**, U. S., 8-347  
**Salad oil**, cottonseed oil used for, 9-312  
**Saladin**, sultan of Egypt and Syria  
 and Richard the Lion-hearted, 12-\*372, 373  
 captures Jerusalem, 5-283  
 empire of, 5-\*206  
**Salamanca**, Spain, House of Shells, 12-\*6  
**Salamanders, tailed amphibians**, 3-†428-31, \*222  
**Salamis**, island, Mediterranean, restored to Athens by Solon, 12-336  
**Salamis, Battle of**, 5-164  
 commemorated in "The Persians," 13-34, 44  
 Themistocles' strategy, 12-339  
**"Salammbô,"** novel by Flaubert, 13-132  
**Salary**, *see* Wages  
**Salcedo, Juan de**, captures Moro strongholds in Philippines, 5-564  
**Salem**, Mass., 8-170  
 Colonial architecture; doorways, 11-\*503, 505

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Salem**—*continued*

- founders, 8-168
- glassworks, 12-36
- witchcraft trial, 7-\*148
- Salem, N. C.**, 8-290, 294
- Salem, N. J.**, Quaker settlement, 8-251
- Salem county, N. J.**, agriculture, 8-245
- Sales, bargain**, reasons for, 7-538
- Salesbury, William**, co-author of Welsh Bible, 6-140
- Salic Law**, 6-27
- Salicylic acid**, 9-446
- Salieri, Antonio**, music teacher, 12-298
- Saline River, Kansas**, 8-131
- Salisbury, N. H.**, birthplace of Daniel Webster, 8-\*238
- Salisbury Cathedral**, 11-\*472, 475
- "**Salisbury Cathedral**," painting by Constable, 11-\*315
- Salisbury Down**, battle on, in Arthurian romances, 14-403
- Salisham Indians**
  - Flathead tribe, 8-216
- Saliva**, nature and function of, 2-355, 356
  - appetite secretion, 2-356
  - birds' use of, in nest building, 4-39
  - cause of flow, 2-356
- "**Salmagundi**," Irving's journal, 13-294
- Salmon**, fish, 3-†245-50
  - caught with "fish wheel," 9-364
  - eggs, 3-†247, \*248
  - growth stages of young, 3-†247
  - hatchery, 3-246
  - industry, in Alaska, 8-14
  - large salmon, 3-\*212
  - parr (young salmon), 3-248
  - trip to fresh-water spawning grounds, 3 \*244, 245, †246
  - varieties of, 3-249
  - where caught: canning, 9-364, †368
  - Columbia River, 8-328, 330
- Salmon Falls, or Salmon River**, Eastern United States, 8-242-A
- Salmon River**, Idaho, 8-92-A
- Salmon River Mountains**, Idaho, 8-87
  - transportation difficulties, 8-91
- "**Salome**," opera by Richard Strauss, 12-316
  - baritone oboe used in, 12-258-A
  - bass viol used in, 12-258
  - double-bassoon solo, 12-258-A
- Salon**, in French society, 13-122
- Salon of Royal Academy**, type of paintings shown, 11-283, 324, 337
- Salon of the Independent Artists**, 11-349
- Salonika, Gulf of**, Greece, map, 6-595
- Salt, production and preparation**, main article, 9-†411-14; 1-44
  - ancient ideas about, 1-281
  - blood contains, 2-339, 345
  - chemical composition, 1-550
  - death to chickens, 9-352
  - electrolysis, 1-557

**Salt, production and preparation**—*continued*

- Great Salt Lake, 1-†44, 473; 9-†411, \*412
- Great Salt Lake Desert, 8-396
- molecules, 1-†357
- ocean, effect upon rocks, 1-70
- refining, 9-\*410
- sources, 9-411-†12; 1-44; 3-74
  - desert deposits, 5-453
  - Oklahoma, 8-316
  - Utah, 8-391, \*394
- uses, 9-413, 414
  - "first aid" remedy, 2-402
  - preservation of meat, 9-326
  - why necessary to life, 9-413
- Salt Creek oil field**, Central Wyoming, 8-\*450, 452
- Salt hay**, 2-148
- Salt Lake City**, Utah, 8-389
  - built by Mormons, 7-244
  - industries, 8-395
  - locust plague, 3-367
  - monument to gulls, 3-†368
  - Mormon Temple and Tabernacle, 8-\*390
  - rainfall and temperature, 8-396
  - State Capitol, 8-\*389
  - university, 8-390
- Salt Lake Valley**, 8-\*395
- Salt-marsh frog**, 3-\*420
- Salt Plains Migratory Bird Refuge**, 8-320-B
- Salt River**, Ariz., 8-24
  - irrigation, 8-24
- Salt River Bird Refuge**, Ariz., 8-24-A
- Salt water**, buoyancy, 1-473
- "**Salt Water Ballads**," by Mascheld, 13-270
- Salt-water crocodile**, 3-440
- Salt water fish**, *see* Fishes, marine
- Saltbush**, 5-560-J
- Saltcellar**
  - by Benvenuto Cellini, 12-88
  - Elizabethan, 12-90
  - pottery, 12-\*54
- Salton Sea, or Salton Sink**, Calif., 8-42
- Saltpeter**
  - ammonia used in manufacture, 10-546
  - gunpowder contains, 10-416
  - glass manufacture, use in, 12-26
- Salts**
  - necessary to plants and animals, 2-41
  - organic, in blood, 2-345
- Saluda River**, South Carolina, 8-356
- Saluki** (gazelle hound), 4-\*490
- "**Salus Populi Suprema Lex Esto**," quotation from Cicero, 8-212-B
- Salute to the Flag**, 14-572
- Salvador**, state, Central America, description, 7-45-46; general data, 7-48-A
  - agriculture, 7-46
  - area, 7-48-A
  - climate, 7-48-A
  - flag color plate, 14- following 570, no. 22
  - government, 7-48-A
  - location, 7-48-A

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Salvador**—*continued*

- map, 7-598  
 mixture of races, 7-43  
 people, 7-48 A  
 physical features, 7-48-A  
 products, 7-48-A; 9-219-A  
 volcano, 1-75  
**Salvation Army lassie** in World War I, 7-322  
**Salvatore, Victor**, statue by, 11-\*373  
**Salviati**, mosaics by, 12-113  
**Salween or Salwin River**, Southern Asia  
   length, 10-253  
   map, 5-588, 581  
**Salzburg**, Austria  
   Mozart's Museum, 12-258-D, 258 F  
**Sam Slick**, character in Haliburton's novels, 13-574-75  
**Samar**, island, Philippines, map, 5-595  
**Samara**, winged fruit, 2-270, 272  
**Samarang**, island, No. Pacific Ocean, 8-466  
**Samaria**, city, Palestine  
   fall of, 5-126  
   made capital of Israel, 5-124  
   rebuilt, 5-127  
   "Samaritaine, La," pump, 10-537  
**Samaritans** in modern Palestine, 5-\*140  
**Samarium**, element, symbol, atomic no. and wt., 1-\*551  
**Samarkand**, region, Asiatic Russia, 5-435  
   map, 6-602  
**Sambar**, deer, 4-\*402, \*409, 413  
**Samlets**, young salmon, 3-\*247  
**Samnites**, people  
   attempt to bribe Dentatus, 5-\*222  
   defeated by Romans, 5-206  
**Samoa**, islands, So. Pacific Ocean, description and history, 8-466-67  
   American naval base, 7-300  
   climate, 8-467  
   dispute over occupation of, 7-289  
   dwellings, 8-\*463  
   government, 8-466  
   by New Zealand, 5-541  
   headdress, 9-\*88, \*93  
   map, 5-572  
   ownership, 5-522  
   people, 8-\*464, \*465, 466, 467  
**Samoli**, donkey, 4-\*509  
**Samoset**, Indian chief, 8-151  
**Samothrace, Victory of**, statue, 11-55, \*56  
**Samoyeds**, dogs, 4-\*492-93, \*499  
**Sampan**, water craft, 10-\*219  
**Samplers and how to make them**, color plate, 14-F76  
**Samson, William T.**, victory at Santiago, Cuba, 7-294, 296  
**Samson**, Biblical hero, 5-122  
   "Samson," by Handel, 12-265  
   "Samson," painting by Guido Reni, 11-\*185  
   "Samson Agonistes," by Milton, 13-170  
**Samson and Delilah**, story of, 5-\*121

- "Samson and Delilah," opera, 12-253  
 "Samuel," painting by Reynolds, 11-\*296  
**Samurai**, Japanese social class, 5-357  
**San Angelo, Castle of**, Rome, 11-\*437  
**San Antonio**, Tex., industries, 8-385  
   "San Antonio," one of Magellan's ships, 13-462, 463  
**San Antonio mission**, *see* Alamo  
**San Diego**, Calif.  
   first colony, 7-230  
   harbor and naval base, 8-41; 7-493  
   memorial, 7-411  
   rainfall, 8-42-A  
**San Domenico**, church, Siena, 11-119  
   "San Felipe," Spanish merchantman, 12-405  
**San Francisco**, Calif., 8-41  
   a quay port, 10-246  
   coal imported, 10-242  
   earthquake damage to City Hall, 1-†80  
   harbor and Golden Gate, 8-†39, 42  
   in the 1850's; gold rush, 13-333  
   telephones, 10-113  
   temperature, 8-42-A  
**San Francisco Bay**, wasps on marshes of, 3-307  
**San Francisco Conference**, 6-552-55, \*551  
**San Francisco Mountains**, Ariz., highest peak, 8-24  
**San Gabriel Mission**, 11-\*499  
**San Giovanni**, church of, Ravello, capital, 12-\*94  
**San Giovanni**, Bel, church, Florence, *see* Baptistery  
**San Ildefonso**, Indian pueblo, 8-\*258  
   Indian pottery, 12-61  
**San Jacinto, Battle of**, 7-235; 8-380; 12-516  
   holiday observed on anniversary, 8-386-A  
**San Jacinto Monument**, 8-\*375  
**San Joaquin River**, Calif., 8-39, 42  
**San Joaquin Valley**, Calif.  
   agriculture, 8-39  
   marsh; birds, 4-\*100  
**San José Plateau**, Costa Rica, 7-48-B  
**San Juan**, capital of Porto Rico, 7-59  
   high and low temperatures, 7-60  
**San Juan**, river, Central America, 7-47  
   map, 7-599  
**San Juan**, river, U. S., 8-396  
   New Mexico, 8-262  
**San Juan de los Caballeros**, settlement founded, 8-258  
**San Juan Hill**, Cuba, American victory at, 7-296  
**San Juan Mountains**, Colo., 8-52-A  
**San Lorenzo**, church, Florence, design of Brunelleschi and Ghiberti, 11-\*482  
**San Lorenzo**, church, Rome, garden and cloisters, 5-\*286  
**San Luis Park**, Colo., 8-52-A  
**San Luis Potosi**, state, Mexico, map, 7-597  
**San Marco** (Fort Marion), Fort, St. Augustine, Fla., 7-†411  
**San Marino**, Calif., Henry E. Huntington Library, 10-561  
**San Marino**, republic, Europe, 6-467

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

- San Martin, José de**, South American patriot, 5-505, 507
- San Salvador**, capital of Salvador, Central America, 7-45
- San Salvador** (Watling Island), Bahamas, 7-53  
discovery by Columbus probable, 7-116; 13-450
- San Vitale**, basilica of, Ravenna, capital, 12-\*94
- San Xavier Mission**, Tucson, Ariz., 11-\*521
- Sanctuary**, meaning, 4-517
- Sanctuary**, of Egyptian tomb, 11-412
- "Sanctuary of the Birds, The,"** 4-517
- Sand, George** (Armatine Lucile Aurore Dupin), Baroness Dudevant, life and works, main article, 13-130
- Alfred de Musset's love for, 13-124
- Balzac and, 13-127
- Chopin and, 12-292
- correspondence with Flaubert, 13-132
- portrait, 13-\*130
- Sand**, 1-40, 95
- carried by streams, 1-48, 49; 3-62
- carried to sea, 3-4
- diatoms contain, 2-69
- for floor covering, 12-158
- glass made from, 12-26
- grinding power, 1-95
- Holland grass binds, 7-\*466
- mountain formation, 1-22
- New Mexico desert, 8-256
- uses, 1-537
- Sand blasting**, 1-462
- Sand boa**, 3-498, \*500
- Sand-box tree**, seed dispersal, 2-214
- Sand Cutters**, nickname for people of Arizona, 8-24-A
- Sand darter**, fish, 3-227
- Sand dollar**, sea urchin, 3-137
- Sand dunes**, in national monument, 8-52-B
- Sand filters**, for purifying water, 10-542
- Sand-hill crane**, bird, 4-\*106
- Sand Hill State**, nickname for Arizona, 8-24-A
- Sand Island**, one of Midway Islands, 8-464
- Sand-lapper State**, nickname for South Carolina, 8-356-A
- Sand Mountain**, Georgia, 8-84
- Sand painting**, Indian, 7-\*97
- Sand River Convention**, South Africa, 5-482
- Sand shark**, 3-\*199
- Sand star**, starfish, 3-133
- Sand viper**, 3-\*490
- Sandals**, 9-56, 57, \*58, \*60
- Sandalwood**, 8-458
- Sandalwood Island** (Sumba), Indian Ocean, map, 5-600
- Sandburg, Carl**, poet, 13-\*349, 350
- portrait, 13-\*349
- Sanderling**, bird, 4-116
- Sanders, Thomas**, association with Alexander Graham Bell, 10-111
- Sandhillers**  
nickname for people of Illinois, 8-106-A
- Sandhillers—continued**  
nickname for people of South Carolina, 8-356-A
- Sandpaper**, how to smooth wooden surface with, 14-†26
- Sandpeeps**, birds, 4-116
- Sandpipers**, wading birds, 4-115, 116
- Sandstone**, composition, 1-95
- Carboniferous, 3-27
- eras found in, diagram, 1-\*40
- flexible, 1-\*41
- formation, 3-4
- fossils in, 3-21
- sedimentary rock, 3-27
- where found, 9-380
- coal beds, 3-\*28
- Sahara Desert, 5-453
- Sandstorm**, 1-\*228, †232
- Sandusky**, Ohio, industries, 8-311
- Sandusky River**, Ohio, 8-312-A
- Sandwich glass**, 12-36
- Sandwich Islands**, see Hawaiian Islands
- Sanford**, Maine, manufacturing, 8-154
- Sangre de Cristo**, mountain range, Colo., 8-52-A
- New Mexico, 8-262
- Sanhedrin**, Great, of Jews, 5-133
- Sanitary chemistry**, 10-549
- Sanitary Commission**, Civil War, nursing by, 7-428
- Sanitation**  
bathrooms of ancient Crete, 5-146; 11-32
- baths, Roman, 5-\*239, 248; 11-62, 438
- baths on modern steamer, 10-\*296, 297, 302, \*303
- garbage disposal, 7-400
- modern dairy, 9-335, 336, 338, 342
- personal cleanliness, 2-291, \*419, 420
- sewage system at Cnossus, 11-416
- sewage systems, modern, 7-397-98; 10-549
- street cleaning, 7-400
- water supply, 10-540, 542
- Sans Souci**, palace, Potsdam, 6-222
- Sanskrit language and literature**, 5-367, 369
- word for river, 8-116
- Santa Anna**, Antonio López, the Alamo captured; defeats, 7-83, 84, †235, 237; 8-375; 12-516
- land grants, 8-379
- Santa Barbara Islands**, U. S., 7-343-C
- Santa Claus**, legends about, 14-589
- Santa Croce**, church, Florence, 11-\*483
- "Annunciation" from, 11-\*130
- in view of Florence, 11-\*123
- Santa Cruz**, island, see St. Croix
- Santa Cruz, Battle of**, Canary Islands, 12-421
- Santa Fe**, New Mexico, 8-254
- founded, 8-258
- resort, 8-261
- taken by Col. Kearny, 7-238
- temperature, 8-262
- Santa Fe Trail**, 7-232; 8-259

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- "Santa Maria,"** Columbus' ship, 13-†450; 10-  
\*158
- Santa Maria della Salute,** church, Venice, 11-  
484, \*487
- Santa Maria delle Colonne,** church, Syracuse,  
Sicily, 6-\*474
- Santa Maria Maggiore,** church, Rome, 11-\*442
- Santa Maria Novella,** church, Florence, deco-  
rated by Ghirlandaio, 11-145
- Santa Maria Rotunda,** church, Rome, 11-430
- Santa Rosa,** Honduras, 7-47
- Santa Sophia,** mosque, Constantinople, *see* St.  
Sophia
- Santa Susana Pass,** Calif., color plate, 10-opp.  
174
- Santee River,** South Carolina, 8-356
- Santiago,** Cape Verde Islands, captured by  
Drake, 12-405
- Santiago,** capital of Chile, 5-516, \*517, \*518  
founded, 5-499; map, 5-604, E4  
rainfall and temperature, 5-518-H
- Santiago,** Cuba, 7-56  
battle, 7-296, 297
- Santiago,** early name for Cuba, 7-56
- "Santiago,"** one of Magellan's ships, 13-462, 463
- Santiago de Compostela,** Spain, pilgrimage to,  
11-90
- Santo Domingo,** capital of Dominican Repub-  
lic, 7-54-A, †58  
captured by Drake, 12-405
- Santo Domingo parrot,** 4-\*192
- Santos, Brazil**  
coffee port, 5-514  
commerce, 10-241
- Santos-Dumont, Alberto,** flights in Paris, 10-  
314
- São Francisco River,** in E. Brazil  
basin area, 10-257  
length, 10-253  
map, 5-603
- São Paulo, Brazil**  
coffee plantations, 5-513; 9-130  
serpentarium, 3-\*497
- Saône region,** France, wine, 6-202-B
- Sap**  
in plants, 2-9  
in trees  
maple tree, 2-235 fol  
sucked by birds, 4-†73
- Sap, cell,** of plant, 2-9
- Sapodilla,** tree  
chicle from, 9-292, \*293  
fruit, 9-196
- Sapphires,** 9-†431, 432, 433  
color plate, 9-frontispiece  
largest mine, 8-220-A  
producing regions, 9-433
- Sappho,** Greek poet, life and poems, main ar-  
ticle, 13-†30-32; 5-170
- "Sappho,"** opera by Gounod, 12-308
- Saprophytes,** plants, 2-\*55, †56, 74, 76
- Sapsucker,** bird, 4-†73; color plate, 4-\*89
- Sapwood,** of stem, 2-†29
- Saracenic architecture,** 11-†449-51, \*453
- Saracens,** Mohammedans, 5-269  
in Song of Roland, 14-†337-42  
menace to Christendom, 5-281, \*282  
*see also* Crusades; Mohammedans and Mo-  
hammedanism; Moors
- Saragossa (Zaragoza),** Spain, in legend of Ro-  
land, 14-338
- "Sarah Constant,"** ship, 7-121
- Sarai,** U.S.S.R., founded, 6-426
- Sarajevo,** Yugoslavia  
assassination of Franz Ferdinand in, 6-274,  
363  
City Hall, 6-\*365
- "Saratoga,"** U.S. aircraft carrier, 10-\*366; 7-484
- Saratoga, Battle of,** Burgoyne's surrender, 7-  
168, 170
- Saratoga Springs, N. Y.,** mineral springs and  
popular resort, 1-90
- Sarawak,** Borneo, 5-427
- Sarcophagus**  
Archbishop Theodore, Ravenna, 11-\*76  
Byzantine, 12-\*99  
Etruscan, 5-191  
Italian, 11-†126  
Roman, 11-\*66, \*67  
relief from, 11-\*107
- Sardines,** 9-†366  
exported by Portugal, 6-337
- Sardinia,** island, Mediterranean Sea, descrip-  
tion, 6-472  
map, 6-589  
realm of Victor Amadeus, 6-303
- Sardis,** ancient city, Asia Minor, capital of the  
Lydians, 5-404
- Sargasso Sea** (brown seaweed area), 2-69
- Sargent, John Singer,** painting, 11-366  
paintings, 11-\*362-64  
"Children of Asher Wertheimer, Esq.,  
The," 11-\*362  
"Madam X," 11-\*363  
prophet Hosea from mural, 11-\*364
- Sargon I,** Semitic king, 5-80, 85
- Sargon II,** king of Assyria, reign, 5-91  
palace at Khorsabad, 11-407  
palace near Nineveh, 5-\*84, 91
- Sarmatians,** people, in Europe, conquerors of  
Scythians, 6-424
- Sarpi, Fra Paolo,** dying words made Idaho state  
motto, 8-92-B
- Sarras, City of,** in Arthurian legends, 14-398
- Sarsaparilla,** drug, 9-219-A
- Sarsens,** Druid stones, 10-30, \*483
- Sarto, Andrea del,** Florentine artist, 11-165  
paintings  
"Holy Family," 11-\*166  
"Madonna of the Harpies," detail, 11-\*165  
"St. Agnes," 11-\*166
- "Sartor Resartus,"** by Carlyle, 13-236

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Saskatchewan**, province, Canada, 7-29-T, 29-U, 33-A, 33-B; map, 7-592  
enters Canadian federation, 7-28  
national park, 7-29-V
- Saskatchewan River**, Canada, Rocky Mts. to Lake Winnipeg, 7-33-A; 10-253; map, 7-592  
used by fur traders, 10-139
- Saskatoon**, Saskatchewan, city, 7-29-U
- Saskia**, wife of Rembrandt van Ryn  
death, 11-274  
marriage to Rembrandt, 11-273
- "Saskia in the Red Hat with the Feather,"**  
portrait by Rembrandt, 11-†273
- Sassafras**, herb  
odor, 9-209  
tea, 9-138
- Sassafras Mountain**, South Carolina, height, 8-356
- Sassanids**, Persian rulers, 5-406
- Satellites**, *see* Moons; Planets
- Satin bower bird**, 4-†186
- Satinwood furniture**, 12-194
- Satire**, defined, 13-179
- Satirists**, 13-179  
English  
Dryden, 13-174  
Pope, 13-179, 185  
Swift, 13-178, 179  
French; Rabelais, 13-105  
Greek; Aristophanes, 13-39  
Latin  
Horace, 13-51  
Juvenal, 5-242
- Satrapies**, Persian, 5-103
- Saturation**, atmospheric, 1-240
- Saturday**, origin of name, 10-483
- Saturday Club**, Boston, 13-309
- Saturn**, (Cronus), god, 1-155; 10-\*459; 14-407
- Saturn**, planet, 1-†155-57, \*158; table, 1-106  
moons, 1-123  
place in solar system, color plate, 1-98; table, 1-106  
relative size, 1-\*16  
rings explained by Huygens, 13-377
- Saturn**, temple of, Rome, 5-\*231
- Satyrs**, sylvan demigods, 12-324; 14-437
- Saudi Arabia**, country, Asia, *see* Arabia
- Sauer River**, Europe, 6-355-A
- Sauk**, or **Sac**, Indian tribe  
Black Hawk War, 8-99, 442  
Oklahoma land grant, 8-317  
Wisconsin, 8-440
- Saul**, king of Israel, 5-122
- "Saul,"** oratorio by Handel, 12-265
- Saul of Tarsus**, *see* Paul, Saint
- Sault Sainte Marie**, Mich., early settlement, 8-181
- Sault Sainte Marie Canal**, U. S., 10-267; 8-185
- Sausage making**, 9-\*322, 329
- Savages**, 5-42; *see also* Man, primitive
- Savanna sparrow**, 4-84
- Savannah**, Ga.  
captured by British, 8-79  
commerce, 8-83  
first colony, 8-78  
map, 8-487  
taken by Sherman, 7-264
- "Savannah,"** ship, makes first trip across Atlantic, 10-\*221, 222
- Savannah River**, U. S., between Georgia and South Carolina, 10-255  
Georgia, 8-84  
maps, 8-486, 544  
North Carolina colony at mouth, 8-78  
South Carolina, 8-356
- Savannah River Migratory Bird Refuge**, South Carolina, 8-356-A
- "Saved,"** painting by Sir Edwin Landseer, 3-\*66
- Savery**, Thomas, English inventor, steam engine of, 10-396
- Savery**, William, furniture, imitating Chippendale, 12-198
- Saving**  
easier for wealthy, 7-548
- Savings accounts** in banks, 7-516, 521
- Savonarola**, Girolamo, life and teachings, main article, 13-†538, 40  
death inspires Botticelli's *Calvary*, 11-147  
denounces luxury of Florence, 11-146, 147  
influence; martyrdom, 6-302  
portrait, 13-\*539
- Savonnerie tapestry carpet**, 12-161
- Savory**, herb, 9-311
- Savoy**, house of, 6-303  
Italy, 6-303, 305, 308  
Switzerland, 6-247
- "Savoyard Vicar's Profession of Faith,"** by Rousseau, 13-19
- Savu**, island, East Indies, map, 5-596
- Saw**  
coping, 14-†26  
diamond, 9-379  
how to use, 14-†23  
types used in lumber-making, 9-\*255, 256
- Sawatch Range**, *see* Saguache
- Sawbill**, wild duck, 4-120
- Sawfish**, 3-201, \*202
- Sawin**, Birdofredom, character in "The Biglow Papers," 13-313
- Sawmills**, 9-\*254, \*255, 256
- Sawtooth Range**, Idaho, 8-92-A
- Sawyer beetles**, 3-340
- Sax**, Adolphe, saxophone invented by, 12-258-E
- Saxo Grammaticus**, Danish historian, 6-410
- Saxon sheep**, 9-75
- Saxons**, Germanic people  
arms and armor, 12-\*99; 10-\*355  
Britain invaded by, 5-264; 6-6  
converted to Christianity, 12-369  
England, 6-11  
influence on English character and civilization, 6-16

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Saxons, England- continued**

- struggle for mastery, 5-292
- European migration, 5-268
- flag, color plate, 14-facing \*572
- ironwork, 12-\*3
- knowledge of coal, 9-435
- subdued by Charlemagne, 5-287; 6-\*166
- submission to Franks, 6-206
- see also* Anglo-Saxons

**Saxony, state of Germany, 10-257**

- map, 6-582

**Saxophone, musical instrument, 12-258-F****Sayle, William, early American colonist, 8-350****"Scab," worker during strike, 7-563****Scaevola, Caius Mucius, before Lars Porcenna, 5-\*200****Scafell Pike, highest peak in England, 6-108-B**

- map, 6-572, C2

**Scala family, rulers of Verona, 6-299****Scalawags in the South, Reconstruction period, 7-272****Scalds, treatment, 2-404****Scale drawing, 14-\*59-69****Scale worm, 3-\*124****Scalene triangle, geometric figure, 10-†439****Scales, mollusk**

- armadillo, 4-454
- fish, 3-196, 213
- pangolin, 4-456
- reptile, 3-482

**Scales, botany**

- bud, 2-24, †133
- bulb, 2-33

**Scales, constellation, *see* Libra****Scales, musical development, 12-206 8, 215**

- chromatic, 12-258-A
- Greek modes, 12-206, 207-8, 215
- Gregorian, 12-212
- major and minor, 12-208, 215
- tempered, 12-231

**Scales and balances, 10-†371 fol.**

- for weighing diamonds, 9-431
- principle of, 10-\*372

**Scallop, shellfish, 3-156, †157****Scalp**

- under the microscope, 13-\*363
- with hairs, 2-\*288

**Scalping by Indians, 7-106****Scaly anteater, 4-456****Scandinavia, ancient name for Norse countries, 6-†370-77**

- adoption of Christianity, 6-377
- agriculture, 6-376
- archaeology, 6-371, †373
- Bronze Age, 6-373; 12-14, †16
- climate, 6-371
- crafts
  - bronze work, 12-14, 16; 6-373
  - carving, 6-373, \*374
  - gold and silver work, 12-90, 92
- extent of, 6-371
- geologic changes, 6-371

**Scandinavia continued****history**

- Denmark, 6-409-16
- early history to about 1000 A. D. (Viking Age), 6-†370-77
- Iceland, 6-†318-20
- Norway, 6-†379-90
- Sweden, 6-†393-407

**ironwork, 12-8****language and literature, *see* Scandinavian language and literature****maps, 6-570**

- Denmark, 6-598
- Norway, and Sweden, 6-596
- mythology, 6-376, †370, 14-429
- Fiddas, 6-420

**Volunga Saga, 14-310****Napoleonic Wars, 6-388, 407, 416****prehistoric snowfields, 3-60****racial background**

- ancient people, 6-371
- members of Aryan race, 5-44
- modern people, 6-372

**Stone Age, 6-371****trade, early, 6-374, 375****viking life and legends, 6-376****writing, runic, 6-†374*****see also* Denmark; Iceland; Norway; Scandinavians; Sweden****Scandinavian language and literature****influence of Danish language on English, 10-10, 11****Norse, 6-419, 420, 14-310****Norwegian, 6-390****Swedish, 6-407*****see also* Scandinavia, mythology****Scandinavian mythology, *see* Scandinavia, mythology****Scandinavian Peninsula, 6-371****Scandinavians, people**

- a seafaring race, 6-373, 374
- emigration; settlements, 6-375
- Germanic ancestry, 5-271
- Minnesota populated by, 8-197
- relation of Finns to, 6-456
- Russian states organized by, 6-424
- ships, 10-\*164, 166
- story of the vikings, 6-†370-77
- see also* Norsemen; Vikings

**Scandium, element, symbol, atomic no. and wt., 1-\*551****Scania, plain of Sweden, 6-407-B****map, 6-597****Scarab beetle, 3-\*272, \*274, †331-32****in pottery, 12-54****Scarabs, Egyptian gems, 12-102, \*119****Scarlatti, Alessandro, opera music, 12-223, 225****aria perfected by, 12-223****overtures to operas, 12-225****Scarlatti, Domenico, 12-234****Scarlet cardinal, bird, 4-133**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Scarlet carnation**, 8-312-B  
**Scarlet-faced monkey**, 4-264  
**Scarlet ibis**, 4-\*11  
**"Scarlet Letter, The,"** by Hawthorne, 13-299, 302  
**Scarlet tanager**, bird, 4-†64  
   appetite, 4-10  
   color plate, 4-\*25  
   in tropical America, 4-180  
**Scarp**, in physiography, 8-377  
**Scaup** (raft duck), 4-119  
   color plate, 4-\*120  
**Scaurus, Marcus**, glass brought to Rome by, 12-28  
**Scavengers**  
   bacteria as, 2-17, 18  
   birds as, 4-159, 162, \*193  
**Scenario**, in photoplay, 10-507, 508  
**Scenery**  
   English; Restoration Period, 12-331  
   moving-picture, 10-†507-12  
   Vitruvius a model for, 12-328  
**Scenery of United States, national monuments**,  
   main article, 7-†403-9, †415-21  
**"Scenes from Clerical Life,"** by George Eliot, 13-261  
**Scent, sense of**, *see* Smell  
**Scent production**  
   birds, 4-217  
   fur-bearing animals, 4-296, 358, 360, 382, 435;  
     9-302  
   insects, 3-283, 337, 335, 381, 398  
   millepedes, 3-267  
   sea creatures, 3-84, 114, 117  
**Schaefer, Vincent J.**, scientist, 1-\*245  
**Schaefer method of artificial respiration**, 2-†408-10  
**Scheele, Karl William**, studies of oxygen, 1-373  
**Scheherazade, Queen**, relater of "Arabian Nights," 14-†361  
**"Scheherazade,"** by Rimsky-Korsakov, 12-255, 313  
**Scheldt**, river, Europe, 6-345; map, 6-593  
**Schenectady, N. Y.**  
   destroyed and rebuilt, 8-275  
   first television play, 10-\*123, 124  
   industrial importance, 8-281  
**Scheria**, island mentioned by Homer, 6-477  
**Scherzo**, musical movement, 12-240  
**Schiaparelli, Giovanni Virginio**, discoveries on Mars, 1-150  
**Schiller, Johann Christoph Friedrich von**, life and works, main article, 13-†277-80  
   and Goethe, 13-†279  
   Carlyle's life of, 13-235  
   portrait bust, 13-\*279  
**Schipperke**, dog, 4-503  
**Schizopyllum**, fungus, 2-\*73  
**Schleicher, von**, German chancellor, 6-240  
**Schleiden, Matthias Jakob**, cell theory, 2-279, 280  
**Schleswig**, prov., Germany  
   given to Prussia, 12-448  
   Prussian and Austrian interference in, 6-229  
   votes to return to Denmark, 6-409, 411, 416  
**Schleswig-Holstein**, prov., Germany  
   maps, 6-582, 599  
   relations with "Denmark, 6-409, 411, 416  
   taken by Sweden, 6-402  
**Schley, Winfield Scott**, at Santiago, 7-294  
**Schliemann, Heinrich**, archaeological discoveries, 11-13  
   Mycenae, 5-17, 20  
   Troy, 5-15, 16, 143  
**Schnitzler, Arthur**, Austrian dramatist and novelist, in Vienna, 6-273  
**Schoeffer, Peter**, printing experiments, 10-48  
**Schoenberg, Arnold**, 12-252  
**"Scholar Gypsy, The,"** by Arnold, 13-255  
**Scholarships, Rhodes**, founded by Cecil Rhodes, 5-487  
**Schönbrunn**, palace, Vienna, 6-\*263  
**Schongauer, Martin**, art of, 11-206, 207  
**School buildings**, public, 7-†401  
**"School for Scandal, The,"** by Sheridan, 13-205  
**"School of Athens,"** painting by Raphael, 11-167  
**School of the Line**, U. S. Army, 7-478  
**Schools**  
   Alaska, 8-15  
   Babylon, 5-86  
   driving instruction, 2-\*433, \*435, 447  
   England; Gladstone's reforms, 6-100  
   Greece  
     Academy of Plato, 13-7  
     ancient Athens, 5-170  
     Lyceum of Aristotle, 13-9  
     Zeno's, 13-11  
   Ireland, 6-\*159  
   library schools, 10-561  
   libraries' aid to, 10-559-60  
   Newfoundland, 7-33  
   nursery, 7-\*440  
   open air, 2-418  
     Morocco, 5-\*452  
   Pythagoras's, 13-4  
   Scotland, 6-124  
   United States  
     city systems, 7-400  
     county and town, 7-389  
   Indian, 8-132  
     military, 7-\*472, 478, †484 fol.  
   Wales; eighteenth century "circulating charity schools," 6-141  
   *see also* Colleges and Universities; Education; Teachers and teaching  
**Schools of art**, *see* Art, schools and workshops  
**Schools of fishes**  
   flying fishes, 3-\*209  
   herring and mackerel, 3-197  
**Schools of whales**, 4-445  
**Schooner**, sailboat, 10-171

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Schopenhauer, Arthur**, life and works, main article, 13-23-24  
 portrait, 13-\*23
- Schröder, Friedrich Ludwig**, German actor, 12-332
- Schubert, Franz**, life and works, main article, 12-†283-85  
 genius and songs, 12-243  
 portraits, 12-\*241, \*243, 284  
 Salieri teacher of, 12-298  
 trumpet used in symphony in C, 12-258-B
- Schultze, Johann**, 10-446
- Schumacher, Peder**, *see* Griffenfeld, Peder, count
- Schuman, William**, composer, 12-257
- Schumann, Clara Wieck** (Frau Robert Schumann), 12-289, 290  
 Brahms and, 12-302  
 portrait, 12-\*244  
 quoted, 12-252
- Schumann, Robert**, life and works, 12-†289-90  
 Brahms and, 12-302  
 music, 12-244  
 portraits, 12-\*241, \*244  
 recognition of Chopin, 12-292  
 trombone used by, 12-258-B
- Schurz, Carl**, 6-228
- Schuschnigg, Kurt**, Austrian dictator, 6-275
- Schütz, Heinrich**, 12-227
- Schuyler, Elizabeth** (Mrs. Alexander Hamilton), 12-\*507, 508
- Schuyler, Peter**, 8-275
- Schuyler, Philip**, and Alexander Hamilton, 12-508
- Schuykill River**, Penn., 8-341
- Schwann, Theodor**, cell theory, 2-279, 280
- Schwarzenberg, Felix Ludwig Johann Friedrich von, Prince**, 6-270  
 and Hungary, 6-286
- Schwarzwald**, German woods, 6-241-B
- Schwyz**, canton, Switzerland  
 gives name to Switzerland, 6-248  
 map, 6-585  
 member of Everlasting League, 6-247  
 war with Zurich, 6-249
- Sciatic nerves**, 2-\*393
- Science, applied, and invention**, *see* Invention and applied science
- Science and scientists**  
 biographies, 13-†357-43  
 Agassiz, 13-†431-33  
 Audubon, 13-427-28  
 Bacon, Roger, 13-†374-76  
 Brahe, 13-†394-95  
 Buffon, 13-†419-21  
 Burbank, 13-†416-17  
 Cavendish, 13-†378  
 Copernicus, 13-†393-94  
 Cuvier, 13-†423-24  
 Dalton, 13-†382-83  
 Darwin, 13-†434-37  
 Davy, 13-†383-85  
 Edison, 13-†441-43
- Science and scientists—continued**  
 Einstein, 13-408-9  
 Ericsson, 13-†439-40  
 Euclid, 13-†373-74  
 Faraday, 13-†385-87  
 Galen, 13-†358-59  
 Galileo, 13-†396-98  
 Gray, Asa, 13-412  
 Halley, 13-†402  
 Harvey, 13-†360-61  
 Herschels, the, 13-†403-5  
 Hippocrates, 13-†357-58  
 Humboldt, 13-422-23  
 Hunter, 13-†364-65  
 Huxley, 13-437-38  
 Huygens, 13-377  
 Jenner, 13-†365-67  
 Kelvin, 13-†390-92  
 Kepler, 13-398-99  
 Lamarck, 13-418  
 Laplace, 13-405-6  
 Lavoisier, 13-†380-81  
 Lœuwenhoek, 13-†362-63  
 Liebig, 13-387  
 Linnaeus, 13-†410-11  
 Lister, 13-372  
 Lowell, Percival, 13-406-8  
 Lyell, 13-†429-31  
 Mendel, 13-†413-15  
 Newton, 13-†400-1  
 Pasteur, 13-†367-69  
 Priestley, 13-379  
 Spallanzani, 13-†370-71  
 Tyndall, 13-†389-90
- see also names of scientists in the index, as*  
 Cuvier; Harvey; Newton
- camera an aid to, 10-452  
 experiment, 13-152  
 Francis Bacon introduces inductive reasoning, 13-152  
 Greek scientists, 13-†2-4, †9; 5-160, 172  
 theories about polar regions, 13-493, 503  
 theories of matter, 1-533, 540, 541  
 relation of all the sciences, 1-284  
 result of man's curiosity, 5-29  
 riches created by, 10-544  
 scientific method, 13-152  
 use of kites, 14-500  
 what science is, 13-375
- see also under names of the sciences, as* Astronomy; Physics
- "Science of English Verse, The,"** by Sidney Lanier, 13-335
- Scientific charity**, 12-583
- Scientific management** of factories, 2-426
- Scientific method of reasoning**, 13-152
- Scilly Islands**, No. Atlantic Ocean, map, 6-573
- Scion**, *see* Cion
- Scioto River**, Ohio, 8-312-A
- Scioto valley**, corn production, 8-309
- Scippo Africanus Major, Publius Cornelius**  
 conquests, 5-216, 218

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Scipio Africanus Major**—*continued*

- defeats Hannibal, 12-355
- in Spain, 6-319
- returned to his father by Antiochus, 5-215

**Scissor-tailed flycatcher**, bird, 4-137, 138  
color plate, 4-25

**Scissors**, bronze, 12-217

**Scissors kick**, in swimming, 14-536

**Sclera** (white of the eye), 2-296, 300

**Scoot**, sled, 9-251

**Scopas**, Greek sculptor, work of, 11-52-53

**Score**, musical, 12-212

**Score** (twenty), origin of term, 10-423

**Scoresby**, William, Arctic explorations, 13-496

**Scorpio (Scorpion)**, constellation, 1-178

Greek mythology, 14-432

star maps

July and August, 1-178-H

May and June, 1-178-F

zodiac, 1-170

**Scorpion**, animal

courtship, 3-413

member of spider family, anatomy, 3-411, 412

number of legs, 3-273

prehistoric, 3-29

water scorpion, 3-398, 402

**Scorpion**, name for red-headed skink, 3-459

**Scotch-Boardman House**, Saugus, Mass., 11-497

**Scotch borzoi**, dog, 4-490

**Scotch collie**, 4-501

**Scotch people**, characteristics of, 12-565; *see also* Scotland

"**Scotch Symphony**," by Mendelssohn, 12-288

**Scoters**, wild ducks, 4-120

**Scotland**, division of Great Britain, main article,

6-110-34; general data, 6-108-B

*see also* index World War II, 6-493

area, 6-108-B

bagpipe, 12-258-C

Caledonian Canal, 6-108-B

Christianity's spread to, 6-9, 487, 488

climate, 6-108-B

costume, 6-130

education, 6-124, 134

emigration to America, 8-289

flag, 14-573

history, 6-110-34

before union with England, 6-110-21

first kings, 6-111, 144

defeat of Haakon of Norway, 6-112

early relations with England, 6-412

spread of English civilization; knights and barons, 6-112

war with England, 6-25, 113; 12-381-84

France becomes ally, 6-116

Parliament given wide powers, 6-117

child rulers; civil wars, 6-118

"English-wooing" of Henry VIII, 6-120

rule of Mary Queen of Scots, 12-398-401

subdued by Cromwell, 6-68

war with Charles I, 6-63, 66

**Scotland, history**—*continued*

after union with England, 6-123-34

the union; Parliament consents to go out of existence, 6-129

Jacobite rebellions, 6-130

Industrial Revolution, 6-132-34

island possessions, 6-486

labor, 6-132-34

literature; Robert Burns, 13-209-10

location, 6-108-B

maps, 6-575

on map of Europe, 6-570

national hymn, 6-115

people, 6-108-B

period of learning and literature, 6-132

physical features, 6-108-B

racés and languages, 6-111, 124

religious freedom struggled for, 6-116, 120, 121, 124-28

shipbuilding, 10-220

sports, golf, 14-494

trade and industries, 6-132, \*133

linen manufacture, 9-48

mining, 6-108-B

**Scotland, Church of**, 6-63, 128

"**Scotland Forever**," picture, 6-123

**Scots**, Celtic people, migration; give name to Scotland, 6-111

**Scott, Barbara Ann**, champion figure skater, 14-519

**Scott, Dred**, freedom claimed by, 7-250

**Scott, Leon**, secures first voice signature, 10-498

**Scott, Robert**, portrait, 13-509

**Scott, Robert Falcon**

expedition to South Pole, 13-506, \*509, 510, 4-210, \*216, \*218

map of route, 13-502-B

**Scott, Thomas**, 7-24

**Scott, Sir Walter**, life and works, main article, 13-221-23

called "Ariosto of the North," 13-67

"Lord of the Isles, The," 6-114

memorial in Edinburgh, 6-131

opinion of Jane Austen, 13-208

portrait, 13-221

"The Talisman," 12-372

**Scott, Winfield**

opinion of Robert E. Lee, 12-525, 526

takes Mexico City, 7-237, 238

**Scottish Highlands**, 6-108 B

**Scottish terrier**, 4-499

**Scotts Bluff National Monument**, 7-413, 8-228-A

**Scourge of God**, name for Attila, 6-277

**Scouring rushes**, fern allies, 2-92

**Scout organizations**

**Boy Scouts**, 14-541-45

**Girl Scouts**, 14-546-48

**Lone Scouts**, 14-545

motto and slogan, 14-544

oath, 14-543

**Scouting fleet**, U. S. Navy, 7-486

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Scouts**

- Buffalo Bill**, 12-†573-74  
**Daniel Boone**, 12-†469-72  
**Scranton**, Penn., industries, 8-338  
**Scratches**, treatment, 2-405  
**Screech owl**, 4-\*163, 165  
   babies awaiting dinner, 4-\*10  
**Screen** for photo-engraving, 10-†67, 71  
**Screens**, ivory, 12-\*97  
**Screw**, mechanics, 1-\*325, \*326, \*330, 331  
   jack screw, 1-\*326, \*330, 331  
**Screw driver**, how to use, 14-†24  
**Screw pine**  
   Panama hats made of, 9-90  
   pollinated by flying fox, 2-113  
   prop roots, 2-38  
   seeds, 2-\*126  
**Screw propeller**  
   for steamboats, 10-\*222, 223; 13-440  
**Scribes**, Jewish, 5-\*139  
**Scriptures**, Hebrew, 5-138  
   *see also* Bible  
**Scrolls**, books in form of, 5-\*617; 10-\*50  
**Scull**, racing boat, 14-532  
**Scullin, James Henry**, Australian premier, 5-560-C  
**Sculpin**, fish, 3-\*211  
**Sculpture**  
   bronze, *see* Bronze and bronzes  
   carvings on mountain sides, 11-\*361, 364  
   difference between carving and, 12-96  
   glass statues, 12-28  
   importance of medium, 12-141  
   styles  
     American, 11-\*352, \*357-61, 364, 373-77, \*391  
     Assyrian, 11-†26-27; 12-\*106  
     Babylonian, 11-\*22, 25  
     Baroque, 11-\*183, \*187, 188  
     Burgundian, 11-\*92, \*103, 105  
     Carolingian, 11-\*85  
     Chinese, 5-†325  
     Christian, 11-\*74  
     Egyptian, 11-6, †9-20; 9-\*6  
       colossi, 5-†68  
       influence on Greek sculpture, 5-158  
       materials used; decoration, 11-19  
       rules; sameness, 11-12  
       Sphinx, *see* Sphinx, Egyptian  
     Etruscan, 5-\*191; 12-†18; 11\*62  
     Flemish, 11-103  
     French  
       Carolingian, 11-\*85  
       Classicism, 11-\*290, 291, \*325, 327  
       Gothic, 11-\*92, †93-99, †103; 12-\*105  
       similarity of Spanish sculpture, 11-243  
       modernists, 11-\*332, 335, †342-44, \*345, \*347-49, 350  
       pre-revolutionary, 11-\*284, 286  
       under Louis XIV, 11-\*231, \*232, \*235, \*237, †239  
     German, 11-103

**Sculpture, styles—continued**

- Gothic, 11-\*92, †93-99, †103, 105  
 Greek, 11-37, †39, 40, 50,\*54; 5-158, \*170, \*172; 12-102  
   bronze, 12-16  
   conventionalism, 12-343  
   during Hellenistic Age, 11-55  
   Egyptian influence, 5-158  
   famous sculptors, 11-43, 52-53, \*69  
   painting of, 11-49  
 Parthenon, *see* Parthenon, *subhead.* *sculptures*  
   reliefs, 11-†40-42, \*52, \*54  
   sought by archaeologists, 13-255  
 Italian  
   early, 11-†108-9  
   effect of Italian sunshine on, 11-108  
   Baroque, 11-\*183, \*187, 188  
   bronzes, 12-\*12, \*20, †22-23  
   Florentine, 11-†124-32, \*137, †138, \*143, 144  
   influence on Mantegna's painting, 11-138  
   Michelangelo Buonarroti, 11-†155-62  
 Persian, 11-\*27, †28-29  
 prehistoric, 5-32  
 Renaissance  
   Bologna, Gianda, 11-\*169  
   Cellini, 11-\*169  
   Florentine artists, 11-†123-32, \*137, †138, \*143, 144  
   Michelangelo, 11-†155-62  
   Nicola Pisano brings alive, 11-†107-9  
   Roman, 11-†60, 62, †64-71, \*107, 108; 9-\*7  
   history carved in stone, 11-64  
   portraiture, 11-62, 69; 5-247  
   Spanish, 11-\*242, 243, \*246  
   Sumerian, 11-†22, \*23, †24-25  
**Scurvy**, cause and prevention, 9-175  
   vitamins a preventive of, 2-364, 365  
**Scutari**, Albania, 5-\*405  
**Scutellum**, of corn seed, 2-\*126  
**"Scuto Bonae Voluntatis Tuae Coronasti Nos,"**  
   Maryland's motto, 8-162-B  
**Scylla**, fabulous sea monster, 14-\*419-420  
**Scythe**, 10-†409-10; 7-\*454  
**Scythians**  
   in Russia, 6-423  
   knowledge of iron, 12-2  
**Sea**  
   Conrad's stories of, 13-273  
   first sea novels, 13-190  
   Holland reclaimed from, 6-352, 353  
   Masfield's stories and poems, 13-270  
   size, 1-†66  
   *see also* Ocean, and names of seas, as Marmora.  
   Sea of  
**Sea anemones**, main article, 3-†89-95, \*69  
   color plate, 3-\*87  
   companions of crabs, 3-†93, †94, 182; 2-†418  
   creatures living unharmed in, 3-91, 94  
   structure and behavior, 3-90, 92  
   varieties, 3-90

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Sea angler**, fish, 3-207  
**Sea bear**, seal, 4-†327-31  
**Sea beard**, a sea fir, 3-105  
**Sea breeze**, cause of, 1-†231  
**Sea butterfly**, mollusk, 3-148, 157  
**Sea caves**, *see* Caves and grottoes  
**Sea cow**, whale, 4-441, †442  
**Sea crawfish**, 3-187, \*192  
**Sea creatures** in Greek mythology, 14-419-21, 435  
**Sea cucumbers**, animals, 3-†138-39  
**Sea devil**, fish, 3-207  
**Sea dragon** (plesiosaurian), 3-40, \*41  
**Sea eagle**, 4-\*153  
**Sea elephant**, seal, 4-335  
**Sea fan**, coral, 3-\*99, 102  
**Sea firs**, animals, 3-†104-14  
**Sea giant**, turtle, 3-480  
**Sea gull**, bird, 4-†200-3, †204  
**"Sea Gull, The,"** by Anton Chekhov, 13-96  
**Sea hair**, a sea fir, 3-105  
**Sea hare**, mollusk, 3-160  
**Sea horse**, fish, 3-\*139, \*211, 215  
**Sea hound** (dogfish), 3-198  
**Sea iguana**, lizard, 3-452  
**Sea-island cotton**, 9-32; 8-354  
     Porto Rico, 8-470  
**Sea lettuce**, algae, 2-68  
**Sea level**, air pressure at, 1-402, 455, 456  
**Sea life**, main article, 3-†71-220  
     Conrad's stories, 13-273  
     in Hans Andersen's tale, 3-72  
     *see also* Ocean, animals in  
**Sea lilies**, prehistoric crinoids, 3-14, 18, 30, 64  
**Sea lilies**, starfish, 3-135  
**Sea lion**, seal, 4-\*331, †332, 479  
**Sea maps** (charts), 10-304  
**Sea mats**, animal colonies, 3-114  
**Sea moss** (moss animals), 3-\*105, †114-15; 10-\*489  
**Sea mouse**, worm, 3-125, †126  
**Sea parrot** (puffin), bird, 4-200, 204, \*205, 208  
**Sea pens**, coral, 3-102  
**Sea shells**, *see* Shells  
**Sea snail**, 3-147  
**Sea swallow** (tern), 4-204  
**Sea tamarisk**, a sea fir, 3-105  
**Sea toad**, fish, 3-207  
**Sea turtle**, 3-477  
**Sea urchins**, animals, 3-†135-38  
     first appearance on earth, 3-15, 18, 30, 64  
     starfish compared with, 3-136  
**Sea warfare**, change in, 10-415; *see also* War and warfare; Warships  
**Sea water**, *see* Water  
**"Sea Wolf, The,"** by Jack London, 13-341  
**Sea worms**, main article, 3-†117-26  
     home in sponges, 3-84  
     tube builders, 3-†117-23  
**Sea wrack**, animal colonies, 3-114  
**Seadrome**, for aircraft, 10-\*325  
**Seafaring nations**, famous, 10-162 fol.  
     Holland, 6-†353  
**Seafaring nations—continued**  
     Phoenicia, 5-109  
     Portugal, 6-337  
     Scandinavia, 6-373  
         vikings, 6-374  
**Sealing industry**, Alaska, 8-14  
**Seals**, animals, main article, 4-†327-35  
     as pets, 4-334  
     care of young, 4-\*327, 329, 333, 334  
     ears and ear holes, 4-332  
     "Hudson seal," 7-94-B  
     hunted by polar bears, 4-320  
     rookeries, 4-†327-30, 332  
**Seals**, impression instruments  
     Babylonian, 11-26  
     carved gems used as, 12-103  
     cylindrical, 12-\*106  
     for stamping bread, 9-\*239  
     rings used as, 12-\*87, 117, \*119, 122  
     Sumerian, 5-78; 11-25  
**Sealskin**  
     how secured, 4-331  
     imitation, 9-44  
**Seam**, French, 14-†72  
**Seamen**, impressment of, 7-208  
**Séance**, how to run a magic, 14-†125  
**Seaplanes**, 10-\*328-K  
**Searcher** (beetle), 3-334  
**Searchlight**, electric arc light used in, 10-392  
**Searles Lake**, California, potash, 10-546  
**Seashore**, rising and falling of, 1-81  
**Seasickness**, 10-304  
**Seasoning**  
     plants used for, 9-310  
     seeds used for, 2-168  
     spices, 9-206-9  
**Seasons**, main article, 1-†206-11  
     cause of changes, 1-\*111, †201-3, †206, 208-10  
     Flemish paintings depict, 11-\*190, †192, 203  
     growing season, 1-211; 2-195, 196, 256  
     mythological explanation, 14-†413-18  
     polar regions, 1-211  
**Seats**  
     Italian Renaissance, 12-\*183  
     Roman, 12-\*180  
**"Seats of the Mighty, The,"** by Gilbert Parker, 7-29-H  
**Seattle**, Wash., temperature, 8-428  
**Seaweeds**, 2-†66-67, 69  
     hiding place for fishes, 3-207  
     in coral colonies, 3-99, 100  
     prehistoric period, 3-18  
**Sebaceous glands**, 2-289, \*290, 293, 366, 367  
**Sebaldus**, Saint, tomb, 12-†22  
**Sebastian**, Saint, as painted by Mantegna, 11-\*140  
**Sebastiana pavoniana**, shrub, 2-257  
**Sebastopol**, *see* Sevastopol  
**Secchi**, Pietro Angelo, discoveries in light, 1-171  
**Secession**  
     Southern states, 7-250, 253  
     Calhoun's position, 12-519

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Secession—continued**

suggested by New England states during War of 1812, 7-211

**Secession, War of the, see Civil War**

**Secession convention of 1861, where held, 8-200**

**"Second Boer War," 6-101**

**Second Continental Congress, date, 8-277**

**Second Industrial Revolution, 7-566**

**Second Punic War, 5-214-16; 12-353-55; see also Punic Wars**

**"Second Shepherds' Play, The," miracle play, 12-327**

**Second triumvirate, 5-225; 12-362**

**"Second war for independence" (War of 1812), 7-211**

**Secret Police of Russia, 6-441**

**Secret Service, United States, 7-377**

**Secret writing, main article, 14-†153-48**

**Secretary, government, see under office, as Navy, Secretary of**

**Secretary bird, 4-\*162, 163**

**Secretin, hormone, 2-357**

**Section, group in U. S. Army, 7-479-E**

**Secular music, 12-220**

**Sedan, Battle of, 6-216; 12-448**

**Sedan chair, 10-130, \*132, \*134; 5-\*427**

**Seddon, Richard, prime minister of New Zealand, 5-540**

**Sedgemoor, Battle of, 13-175**

**Sedges, plants, 2-148**

flower cluster, 2-\*145

seed dispersal, 2-212

**Sedgwick, Adam, English geologist, 3-21**

**Sediment**

builds soil in mangrove swamps, 3-28

deposited in Carboniferous swamps, 3-27

in mountain building, 1-20

of streams and rivers, 1-49

**Sedimentary rock, 1-11, \*19, 20**

formation in Grand Canyon, 1-46

formed from igneous, 1-41

layers of, diagram, 1-†40

limestone and sandstone, 3-27

made of volcanic substances, 1-41

structure: fossils, 3-3, 19

**Sedition Act, 7-199**

done away with, 7-203

**Seed coat, 2-129**

**Seed leaf of monocotyledons, 2-144**

**"Seed Time," painting by John Frederick Her-  
ring, 7-\*450**

**Seedless orange, 9-175**

**Seeds, kinds and structure, main article, 2-  
†124-29**

dispersal, 2-119, 121, †209-14

plants themselves, 2-213

water; by animals, 2-212

wind, 2-†210-12

dormancy; germination, 2-†216-19

germination of wheat seed, 9-\*99

giant, 2-\*253

hard, 2-217

**Seeds, kinds and structure—continued**

ovules become seeds, 2-104

pollen, importance of, 1-376

relation of fruit to, 2-†118, 119

selection of, 9-\*106

stratification, 2-217

useful to man, 2-\*124, 129

winged, 2-210

see also Spores

**Seeds, cotton, separating from lint, 10-†404-7**

**Seesaw**

how to make, 14-†42

mechanical principles, 1-324, 327

**Segestus, aids Roman invaders of Germany, 6-  
204**

**Segovia, Andrea, guitarist, 12-258-D**

**Segovia, Spain**

alcazar, 6-\*317

Roman aqueduct, 11-62, \*63

**Sei whale, 4-\*443**

**Seigneurs, Canadian landlords, 7-11**

**Seine, river, France, 10-254**

length, 10-253

map, 6-578

**Seines, fishing with, 9-362, †363, \*365**

**Seipel, Ignaz, manages finances of Austria, 6-  
275**

**Seismograph, construction of; earthquakes re-  
corded by, 1-\*81, 82**

**Seizers (harpies), 14-420**

**Sejanus, Aelius, 5-232**

**Sejm, governing body of Poland, 6-454-B**

**Skeletu, African chief, aids Livingstone, 13-  
552**

**Sekigahara, Battle of, 5-354**

**"Selah," occurrence in Psalms, 12-205**

**Selangor, native state, Federated Malay States,  
5-430-B**

**Selective Service Act, U. S., 7-322**

**Selenium, element, symbol, 1-\*551**

**Seleucid kings, 5-218**

**Seleucus I (Nicator), king of Syria, 5-127, 180**

Antioch founded by, 5-4

in India, 5-370

**Self-pollination, 2-108**

**Selish Indians, see Flathead Indians**

**Selish Lake, see Flathead Lake**

**Seljuk Turks, see Turks**

**Selkirk, Alexander, 13-177**

**Selkirk, Thomas Douglas, earl, sends settlers to  
Canada, 8-299; 7-24**

**Selkirk Mountains, Canada, 7-29-W**

**Sellers, Coleman, photographic experiments,  
10-502; discovers hoax, 1-\*315, 316**

**Selling, see Buying and selling**

**Seltzer, or soda water, 13-379**

**Semaphore code, 14-†551**

**Semele and Jupiter, mythological characters,  
14-411**

**Semicircular canals of ear, 2-†282-85**

**Seminole Indians, 8-\*70, 71**

Oklahoma land grant, 8-317

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Seminole Indians--continued**

one of "Five Civilized Tribes," 8-320-B  
reservation, 8-76-A

**Seminole range**, mountains, U. S., 8-454

**Semiprecious stones**, color plate, 9--frontispiece, 432; 433

**Semites**, ancient people, 5-43, †44

Africa, 5-473-B

Arabia home land of, 5-394

art, *see* Semitic art

Assyria, 5-88, 89

Babylonia under rule of, 5-82, 85

birthplace, 5-99

conquest of Sumeria and Babylonia, 5-80, 82

empires of: cease to be ruling race, 5-97, 99

Hebrew tribes, 5-118, 122

Middle Ages, 5-269

modern descendants, 5-97

physical characteristics, 5-336-D

relations with Sumerians, 5-78, 80, 88

religions, 5-44

traders and mathematicians, 5-395

*see also* Arabs; Hebrews; Jews

**Semitic alphabet**, 10-43, 45; 5-111

**Semitic art**, 11-\*22, 25

**Semitic tongues**, language group of Asia, 5-336-D

**Sempach, Battle of**, 6-248

**Senate**, origin of word, 5-201; 10-20

**Senate**, Roman, 5-201; 13-46

**Senate**, United States, 7-364, 365; *see also* Senators

**Senate chamber**, in United States Capitol, 7-\*290, \*365

**Senate office building**, Washington, 7-\*368

**Senators**, United States

election, 7-312, 364

term of office, 7-364

**Seneca, Lucius Annaeus**

relations with Nero, 5-235

tragedies, 12-325

**Seneca Indians**, members of Iroquois League, 8-269

Pennsylvania reservation, 8-342

**Senefelder, Alois**, lithography invented by, 10-66

**Senegal**, colony, Africa, 5-473

**Senegalese-Guinea race**, Africa, 5-445

**"Senior,"** derivation and meanings of term, 10-20

**Seniority rights in Congress**, 10-20

**Sennacherib**, king of Assyria, reign, 5-91

cruelty, 5-103

Jerusalem besieged by, 5-126

**"Sense and Sensibility,"** by Jane Austen, 13-208

**Senses and sensation** (*see also* entries under the main subjects below)

animals

cats, 4-286

dogs, 4-501

four-footed animals, 3-70

touch, 3-70

artificial, 1-419

**Senses and sensation--continued**

**balance**, 2-†282-85

connection with brain centers, 2-389

**hearing**, 2-†302-5

muscle sense ("sixth sense"), 2-285

reflex action in response to calls of, 2-394

sense organs

bats, 4-272

bone protection, 2-†347

insects, 2-392; 3-273, 279, \*346, 348

sense cells, 2-307, 308, 309

sensory hair cells, 2-282, 283

whales, 4-444

**sight**, 1-†436-41; 2-†295-300

"sixth sense," 2-285

skin, 2-291, 292

**taste and smell**, 2-†307-9

touch, 2-291, 292, †295

**Sensitive fern**, 2-90, \*91

**Sensitive plant**, movements of, 2-\*188, 189

**Sensory nerves**, 2-396

**Sentimental comedy**, English, 12-331

**"Sentimental Journey,"** by Laurence Sterne, 6-303; 13-190

**"Sentimental Tommy,"** by Sir James Barrie, 13-268

**Sentimentality** in early English literature, 13-180

**Sentinum, Battle of**, 5-206

**Sepals** of flower, 2-102, \*172

**Separatists**, religious sect, 7-†124

**Separator, cream**, 9-342

**Sephardim**, Jews, 5-137

**Sepia cuttlefish**, artist's ink from, 3-171

**Sepoy Rebellion**, 5-384

**September**, seventh month, 10-482

**Septimius Severus, Lucius**, *see* Severus, Lucius

Septimius, emperor of Rome

**Sequoia National Park**, 8-42-B; 7-407, \*404

**Sequoias**, oldest and largest trees, 2-249, \*253; 7-\*404

age, 2-259, 260

cross section: annual rings, 2-\*28

in national parks, 7-407; 8-42-B

*see also* Redwoods

**Sequoyah**, Indian chief, 2-249; 8-6

**"Serapis,"** British frigate, battle with "Bon-homme Richard," 7-\*492, 493; 12-502

**Serbia**, former kingdom, 6-†363-64; 5-414

in World War I, 6-235, 274

independence, 5-414

seat of government in Corfu, 6-477

**Serbs**, Balkan people, 6-290-B

help to form Yugoslavia, 6-363

**Serfdom**, Middle Ages, 5-†301-3; 7-351

Denmark, 6-412, 413, 416

"half-slaves" in the Transvaal, 5-490

Hungary, 6-281, 284, 285

peasants under feudal system, 7-351

peonage abolished in Guam, 8-472

Poland, 6-446

Russia, 6-428, 434, 436; 13-92

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Serfdom—continued**

- Sweden, 6-395  
villeinage in England, 6-24, 28, 32
- Sericulture**, 9-†36-44
- Seriema**, bird, 4-\*197
- Series and parallel connections**, electricity, 1-†517
- Serious ducks**, game, 14-169
- Seriphos**, island of Aegean Sea, metallic ores, 6-368-B
- Serow**, goat, 4-430
- Serpent Mound**, Indian burial mound, 7-96; 8-304
- Serpentarium**, São Paulo, Brazil, 3-\*497
- Serpents**, *see* Snakes
- Serpula worm**, 3-\*117, \*120, 121
- Serra**, Junipero, Miguel José, *see* Junipero Serra
- Serratius**, defined, 2-184
- Sertorius, Quintus**, in Spain, 6-319
- Serum** made from snake poison, 3-497; 2-408
- Serum** of blood, 2-348
- Serval**, animal, 4-\*284
- "Sesame and Lilies"**, sociological sermon, by John Ruskin, 13-238
- Sesostris III**, king of Egypt, 5-59, 60
- Sessile bud**, 2-131
- Sessile leaf**, 2-23
- Setback**, in skyscrapers, 11-†517, 524
- Seto Naikai**, Japan, *see* Inland Sea
- Setters**, dogs, 4-\*197, \*499-500
- Settlement Act**, Ireland, 6-154, 155
- Settlement Houses**, 7-439  
Hull House, 12-580 81; 7-†433
- "Settlement of Maryland, The"**, painting, 7-\*132
- Settlement work**, *see* Social welfare work
- Settlers**, *see* Pioneers
- Settling tanks**, for purifying water, 10-542
- Seurat, George**, style of, painting, 11-350  
Post Impressionist, 11-380
- Sevastopol**, seaport city, Soviet Russia, fall of, 6-436
- Seven Cities of Cibola**, 7-119
- Seven Devils Canyon**, Idaho, 8-87
- "Seven Follies of Science, The"**, by Plum, 1-315
- Seven Gables**, House of the, Salem, Mass., 11-503
- "Seven Gallant Swabians"**, fairy tale, text, 14-†219 20  
color plate, 14-\*220
- Seven League Boots**, 9-56
- "Seven Ravens"**, fairy tale, text, 14-†195-96
- "Seven Sisters"**, group of anti-trust laws, 8-251
- "Seven That Were Hanged, The"**, by Leoid Andreyev, 13-97
- Seven Weeks' War**, 6-\*227, 229
- Seven wonders of the world**, main article, 5-†184 87  
*see also in index each one by name*
- Seven Years' War** (third Silesian war), 6-221 fol.; 12-418  
America, *see* French and Indian War  
Frederick the Great, 6-221-22; 12-418

**Seven Years' War—continued**

- India, 5-381
- Maria Theresa, 6-222, 264
- Peace of Paris, 5-382; 7-143
- William Pitt's part in, 6-81
- Seven Years' War** between Denmark and Sweden, 6-413
- Seventeen-year cicadas**, 3-†370-73
- Seventh Day Adventists**, on Pitcairn Island, 5-529
- "Seventh of March Speech"**, by Daniel Webster, 7-247
- Seventh Symphony**, of Beethoven, 12-280
- Seyn River**, England, map, 6-573
- Seyn River tunnel**, 10-207
- Severus, Lucius Septimius**, emperor of Rome, rule, 5-248  
arch of, 5-\*231  
portrait bust, 5-\*247  
reproaching his son, 5-\*247
- Sevier Lake**, Utah, 8-391  
disappearance, 8-396
- Sevier River**, Utah, 8-396
- Seville**, Spain  
commerce, 10-259  
map, 6-590, C4
- Seville orange**, 9-172
- Sèvres**, France, porcelain, 12-61
- Sewage**  
cities' systems, 7-397, †398  
Cnossus palace, 11-416  
disposal, 10-549  
Roman: Cloaca Maxima, 11-429
- Seward, William Henry**  
Alaska named by, 8-16-B  
purchase of Alaska, 8-12
- Seward glacier**, Alaska, 8-16-A
- Seward Peninsula**, Alaska, map, 8-560
- Seward's Folly**, name given to Alaska, 8-12
- Sewellel**, animal, 4-\*366
- Sewers**, *see* Sewage
- Sewing**, first lesson in, 14-†72  
ancient bronze utensils, 12-\*17  
*see also* Needlework; Things to make, *subhead* needlecraft
- Sewing machine**, invention and development of, main article, 10-†442-44  
effect on silk industry of Lyons, 7-578  
manufactured at Elizabeth, N. J., 8-248
- Sexfoil**, in stained glass windows, 11-464
- Sextette** from "Lucia di Lammermoor," 12-253
- Sextons** (beetles), 3-332
- Sexual generation**  
fern, 2-†89  
moss, 2-†83
- Seymour, Jane**, queen of Henry VIII, 12-392  
portrait by Holbein, 11-\*213
- Sforza, Ludovico**, duke of Milan, Leonardo da Vinci's letter to, 11-149
- "Shabby Genteel Story, A"**, by William Makepeace Thackeray, 13-241

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Shackleton, Sir Ernest Henry**  
 expedition to South Pole, 13-\*503, \*507, 510  
 portrait, 13-\*507
- Shacks**, how to build, 14-†28, †43, †44
- Shad**, fish, 9-368
- Shaddock**, citrus fruit, 9-173
- Shadoof**, Egyptian water raising device, 10-\*529
- Shadow pictures**, how to make, 14-†8
- Shadow tag**, game, 14-172
- Shadows**  
 density of, on moon, 1-131, 140  
 in art, *see* Light and shadow in art  
 on clouds, 1-\*423, \*425
- "Shadows on the Rock,"** novel by Willa Cather, 13-352
- Shadwell, Thomas**, Dryden's satire on, 13-174
- Shaft**, in architecture 11-†418
- Shaft, mine**  
 coal mine, 9-\*441, 442  
 copper mine, 9-\*421  
 gold mine, 9-\*395
- Shafter, William Rufus**, at Santiago, 7-297
- Shaftesbury, Anthony A. Cooper**, 1st earl, as proprietor of South Carolina, 8-350
- Shagbark hickory**, tree, bark, 2-31
- Shah**, Persian name for king, 5-105
- Shah Jehan**, Mogul emperor  
 Great Mosque of Delphi built by, 5-377  
 splendor of court, 5-375  
 Taj Mahal built by, 9-†432; 11-†450, 12-114; 5-\*366
- Shahaptian Indian family**, 8-89  
 Oregon, 8-327
- Shakespeare, William**, life and works, main article, 13-†153-61  
 Ben Jonson and, 13-163  
 birthplace, 11-\*480; 13-\*154  
 collection of works, 10-561  
 early life; marriage, 13-153-56  
 illustrations by Abbey, 11-†365  
 in London; becomes actor 13-156  
 influence of Marlowe, 13-163  
 "Julius Caesar," quotations from, 12-358, 359  
 "Macbeth," Scottish kings in, 6-111  
 memorial at Stratford on Avon, 13-\*156  
 plots from Plutarch, 13-44  
 portraits, 13-\*153, 154  
 with his contemporaries, 10-\*19  
 quotation from "The Tempest," 7-51  
 source material in Roman history, 5-225, 226, 242  
 tales from his plays, by Charles and Mary Lamb, 13-224
- Shale**, rock  
 Carboniferous fossils in, 3-30  
 covering underground stream, 1-\*91  
 cras found in, diagram, 1-\*40  
 form of, 1-54  
 in coal beds, 3-†28
- Shallow Ford Station, Ky.**, horse racing, 8-137
- Shalmaneser III**, king of Assyria, palace excavated, 5-14
- Shamal**, wind, 5-106
- Shaman**, Eskimo medicine man, 7-36
- Shamash**, sun god, 5-\*87
- Shamrock**, why the Irish emblem, 14-580
- "Shamrock,"** Sir Thomas Lipton's yacht, 14-530
- Shamrock spider**, 3-408
- Shang (Yin) dynasty**, China, 5-316
- Shanghai**, China, 10-264  
 coaling station, 10-237  
 Japanese in, 5-336  
 location by Lat. and Long., 5-336-A  
 map, 5-591, O7  
 mean annual temperature, 5-336-A  
 on North Pacific route, 10-242
- Shannon**, principal river of Ireland, 6-\*147, 162-B  
 length, 10-253  
 map, 6-577
- Shanties**, of logging camp, 9-†246, †248
- Shantung**, China, various ownerships of, 5-335
- Shantung silk**, 9-44
- Sharecroppers**, 7-459; 8-203
- Shares of stock**, *see* Stock
- Sharks**, fishes, 3-†197-99  
 in Silurian period, 3-\*17  
 shellfish enemies, 3-\*149  
 tooth of ancient shark, 2-312  
 unafraid of octopus, 3-\*169
- Sharp, Becky**, character in Thackeray's novel, 13-241
- Sharp-shinned hawk**, 4-153
- Sharpsburg**, Md., battle site of Antietam, 8-162-A
- Shasta Dam**, California, 8-43; 7-\*469; 10-531
- Shasta, Mount**, extinct volcanic peak, 8-40
- Shatt al Arab**, river, 10-263
- Shavian**, meaning of term, 13-271
- Shaw, George Bernard**, life and works, main article, 13-271-72  
 explanation of what money is, 7-503  
 portrait, 13-\*271, \*272
- Shaw, Robert Gould**, and his Negro regiment, memorial by Saint-Gaudens, 11-\*358
- Shawangunk Mountains**, 8-283
- Shawnee Indians**  
 Ohio, 8-305  
 Oklahoma land grant, 8-317  
 South Carolina, 8-351  
 West Virginia, 8-432
- Shay**, one-horse, Norway, 6-\*384
- Shays, Daniel**, leads rebellion, 7-170
- "She Stoops to Conquer,"** by Oliver Goldsmith, 12-331; 13-199
- Shea butter**, used in soaps, 9-312
- Shearing** of sheep, 9-\*80, 81
- Shears**, mechanical principle, 1-\*327
- Sheba, Queen of**, visit to Solomon, 5-457, 458  
 gifts, 5-394; 12-175  
 Saba may be Sheba?, 5-394
- Sheboygan**, Wis., cheese industry, 9-347
- Sheboygan River**, Wis., 8-446

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Sheep and sheep raising industry**, main article, 9-†74-81  
 best breeds, 9-†75, \*77  
 by products, 9-328  
 counting sheep, 9-\*319  
 dye made of blood, 12-157  
 leather, 9-69  
 parchment made from skin of, 9-274  
 pastoral life and poetry, 9-†79  
 shearing, 9-\*80, 81  
 sheep raising regions, 9-75  
   Australia, 5-549, \*551; 9-75-76, \*80  
   New Zealand, 5-539, \*541-2  
   United States, 8-452  
     Montana, 8-219  
     Utah, 8-\*392, 394  
   Western Canada, 7-\*29-V  
 Shetland wool from, 6-486  
 transportation, 9-326  
 used as food, 9-†317, 318, \*325  
 used as medium of exchange, 7-503  
 wild sheep, 4-\*421, †425 fol., \*474; 9-†74, 76  
 wool from, 9-81; 10-\*342  
*see also* Sheep dogs; Shepherds; Wool
- Sheep and wolf**, game, 14-170
- Sheep dogs**, 4-\*493 fol., 501; 9-76 fol
- Sheep gut**, *see* Catgut
- Sheep market**, Ireland, 6-\*157
- Sheep tick**, 10-\*487
- Sheep's-wool sponge**, 3-87
- Sheepsfoot roller**, in road making, 10-\*154
- "Sheepskin"** (diploma), origin of term, 9-274
- Sheet erosion**, 7-468
- Sheet lightning**, 1-248
- Sheet-weaving spiders**, 3-411
- Sheffield**, Eng.  
 map, 6-572, E3  
 steel industry, 10-254
- Sheffield plate**, silverware, 12-\*89, 92
- Sheikh**, from Palestine, 5-\*140
- Sheikh el Beled**, Egyptian statue, 12-\*106
- Shelf**, corner, how to make, 14-†50
- Shelf fungi**, 2-74
- Shell**, animal, *see* Shells, animal
- Shell**, diatom, *see* Shells, diatom
- Shell**, gun, 10-365, 368-A  
 flight of, 1-287  
 shrapnel, diagram, 10-\*365
- Shell**, in atomic structure, 1-\*541, 542
- Shell**, peanut, 9-198
- Shell**, racing boat, 14-532
- Shell Keys Bird Refuge**, 8-146-A
- Shelley**, Harriet Westbrook (Mrs. Percy Bysshe Shelley), 13-228
- Shelley**, Mary Wollstonecraft (Mrs. Percy Bysshe Shelley), 13-†229
- Shelley**, Percy Bysshe, life and works, main article, 13-†228-29  
 association with Byron, 13-227  
 contemporaries, 6-86  
 home, 13-\*228
- Shelley**, Percy Bysshe—*continued*  
 portrait, 13-\*228  
 "Prometheus Unbound," 13-33
- Shellfish**  
 bivalve sea mollusks, 3-†151-60  
   eggs and hatching, 3-158  
   buttons made from, 9-†51  
   clam-fishing, 9-†51, \*52  
   crabs, 3-†174-83  
     eggs and hatching, 3-177  
 fresh-water shellfish, 3-†254-62  
   eggs and hatching, 3-256, 257, 260, 261  
   industry, 9-\*369, 370  
 lobster and other crustaceans, 3-†185-92  
 octopus, squid, and cuttlefish, 3-†166-72  
   eggs and hatching, 3-169  
   pearls from, 3-162, †262  
   prehistoric, 3-9, 15, 18, 24  
   chart, 3-64  
 univalve sea mollusks, 3-†141-49  
   eggs and hatching, 3-148  
*see also* Crustaceans; Mollusks
- Shells**, animal, color plate, 3-\*142  
 abalone, used for inlay and jewelry, 8-40  
 along the seashore, 3-†141  
 argonaut, 3-172  
 brachiopoda, 3-9, 15, 18, 24, 64  
 buttons made of, 3-262  
 chalk made of, 1-51; 3-44  
 crustaceans  
   barnacles, 3-189, 190  
   crab, 3-175, 178, 183  
   crayfish, 3-255, \*257  
   lobster, 3-185, 186  
   prawns and shrimps, 3-187  
   shedding of, 3-178, 186, 190, 256  
 Foraminifera, 3-78-80  
 limestone formed by, 3-44, 51  
 formation of fossils, 3-5  
 fossil, 3-79  
 goby eggs fastened to, 3-211  
 king crab, 3-190  
 mollusks  
   bivalves, 3-\*153, †156-57, 158, 261  
     unusual shells, 3-160  
   fresh-water snail, 3-†259  
   mollusks with remains of shell, 3-170, 171, 172  
   univalves, 3-†141 fol.  
     color plate, 3-\*142  
 mother-of-pearl lining, 3-262  
 on floor of ocean, 3-76, 79, 80; 1-51  
 sea urchin, 3-136, 137  
 snail, 3-†259  
 structure and color, 3-143  
 turtle and tortoise, 3-†465-66, 473, †475, 478  
 used for protection by crabs, 3-\*143, \*174, 181
- Shells**, diatom (algae), value of, 2-69
- Shelter**, main article, 11-†394-524 (*see* Contents Vol. 11 for chapter headings)  
 adobe, 7-43; 9-376

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Shelter—continued**

- Africa, 5-\*458, 479, \*489; 1-\*196; 9-\*377;  
 11-\*399; 12-\*129, 130  
 ancient Hebrew, 11-396  
 Arabian desert, 11-\*400; 5-\*394  
 Assyrian palaces, 11-407  
 Babylonian palaces, 11-407, †408  
 Balkan peasant, 6-\*358 fol.  
 Bedouin Arabs, 11-396  
**building materials**, 9-†375-86; 11-395, 396;  
 7-99  
   bricks, 11-403-4; 9-†376-78  
   skins, 11-\*398  
   stone, 9-†379-83; 5-\*503  
 castles, 5-\*302, \*303, \*304; *see also* Castles  
 cave; prehistoric man, 5-\*23, 30; 11-†396  
 Central America, 7-43  
**city planning**, 7-†446-48  
 cliff dwellings, 7-†93-95, 421; 5-\*21; 11-\*397  
 cottages, stone, Quebec, 7-\*29-C  
 Czechoslovakia, 6-\*358  
 Denmark; castle, 6-\*415  
 dugouts, 11-\*397; 1-\*229; 6-\*484; 9-\*377  
**early dwellings**, 11-†394-401  
 East Indian, 5-523, 525  
 England, 6-\*83; 9-\*375; 13-\*208, \*216, \*219  
 Eskimo, 6-483, \*484; 1-\*196; 7-36; 13-497  
 Fiji Island, 5-\*527  
 Finland; castle, 6-\*456  
 Germany; castle, 6-\*240  
 grass, 8-457, \*458; 11-\*399  
 Greece, ancient, 5-169-70; 12-178  
 Hawaii, 8-457, \*458  
 houseboat, Roman, 5-\*232  
 igloo, 11-\*398; 6-†484; 9-\*379  
 Indians  
   North American  
     Aztecs of Mexico, 7-†72  
     British Columbia; Canada, 7-\*17, \*98  
     cliff dwellings, 7-†93-95, 421; 5-\*21  
     Creek, 7-\*101  
     Digger, 7-\*101  
     Iroquois, 7-\*3, 99  
     lodges and long houses, 7-\*3, \*98, 99  
     Mayas; Mexico, 5-19; 7-90  
     Navajos, 7-\*101  
     Pueblos, 7-†93-94  
     rock shelter, 7-\*101  
     tepee, 7-99, \*100  
     wigwam, 11-\*397; 7-99  
     Zuñi pueblo, 7-\*93  
   South American  
     Incas of Peru, 7-92  
     Venezuela, 7-\*101  
 Iona, 6-\*487  
 Ireland, 6-\*145, \*148, \*153; 13-\*197  
 Jamaica, 7-\*51  
 Java, 5-\*526  
 Kraal, 11-\*399  
 lighthouse, 10-\*226, 227-28  
 lodges and long houses, 7-\*3, \*98, 99; 8-269

**Shelter—continued**

- log cabin, 9-\*377; 7-\*140, \*146; 11-499; 12-  
 †525, \*526  
 lumber camp, 9-†246  
 made of branches, 14-\*565  
 Maoris; New Zealand, 5-\*536, \*541  
 medieval  
   lord's castle and domain, 5-\*302, \*303, \*304  
   peasant's hut, 5-301, \*303  
 Mesopotamia, 11-396  
 Mexico, 7-\*80; *see also* subhead Aztecs and  
   Mayas under Shelter, Indians  
 monasteries for monks, 5-308  
 Mongolian, 5-\*436  
 New York Zoning Law, 11-524  
 North American  
   colonial, 11-502 fol.; 7-\*151  
   early settlers, 11-†495 fol.; *see also* Shelter,  
     log cabins  
   famous old houses, 11-497, \*504, \*507,  
     \*513, \*514  
   Negro shack, 7-\*269  
   of forester, 2-\*247  
   Tennessee shack, 7-223  
   *see also* American architecture; Shelter,  
     Indians  
 Norway, 6-\*385  
 on stilts, 11-\*399  
 origin of complex types, 11-394, 396-400  
 palaces, *see* Palaces  
 Philippine Islands, 5-†563; 7-\*116, \*300; 11-  
 \*397  
 portable, 11-396, 400; 5-\*436  
 Portugal; castle, 6-\*341  
 prehistoric, *see* Lake dwellers; Shelter, cave  
 primitive, 9-375, †376, \*377; 5-\*527  
 refuge against tornado, 1-\*229  
 rock shelter, 6-317; 7-\*101  
 Rome, ancient  
   houseboat, 5-\*232  
   palaces, 12-179  
   Pompeian houses, 5-260; 11-\*434  
 Russia, 11-\*398  
 Samoa, 8-\*463  
 Scotland, 6-\*120, \*121, \*126, \*134  
 slums, 7-448  
 Spain, 6-\*317, \*319  
 Sumerian, ancient, 5-76  
 Sweden; castle, 6-\*395  
   Laplanders, 11-\*397, \*399; 9-\*377  
 Switzerland, 6-\*251  
   prehistoric lake dwellers, 5-\*34, 36; 6-244;  
     11-\*397; 12-†490  
 tents, 11-396  
   for camping, 14-\*549, 556, \*557  
 tepee, 7-99, \*100; 14-\*557  
 thatched  
   Africa, 11-\*399; 5-\*489  
   England, 11-495; 9-\*375  
   Ireland, 6-\*153  
   Jamaica, 7-\*51  
   Norway, 2-\*259

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Shelter, thatched—continued**

- Samoa, 8-**\*463**  
 Scotland, 6-**\*121**  
 tree, 5-523  
 type determined by  
   climate, 11-**\*399**; 1-**\*196**, 13-**\*496**  
   danger of life  
     cliff dwellers, 7-93  
     lake dwellers, 6-244  
     medieval castle, 5-**\*302**, **\*303**, **\*304**  
 Ukraine, 6-**\*367**  
 Wales, 6-**\*137**, **\*138**  
   wattle-work, 11-495, **†496**; 12-**†129**, 130  
   wigwam, 11-**\*397**; 7-99  
 Yugoslavia, 6-**\*365**  
*see also* Architecture, Cottages; Houses; Huts  
**"Sheltered Life, The,"** novel by Ellen Glasgow, 13-352  
**Shem, Israel Baal** (Baal Shem Tov), Jewish reformer, 5-138  
**"Shema,"** of the Jews, 5-132  
**Shen Nung** (Yen Ti), Chinese ruler, 5-315  
**Shenandoah Apple Blossom Festival**, 8-418-A  
**Shenandoah Mountains**, 8-411  
**Shenandoah National Park**, Virginia, 7-409, 8-417  
**Shenandoah River**, Va. and W. Va., 8-418  
**Shenandoah Valley**, ravaged by Sherman, 8-412  
**Shepherd** carrying a lamb, in art, 11-**†74**  
**Shepherd dogs**, 4-**\*493** fol., 501; 9-**\*76** fol.  
**Shepherd Kings**, in Egypt, 5-61  
**Shepherds**, duties, character, 9-77  
   and shepherdesses, in French art, 11-282  
   Arabian, 5-**\*401**  
   legends, 9-78  
   weather signs, 1-**†265**  
**"Shepherd's Calendar,"** by Edmund Spenser, 13-149  
**Shepherdstown**, W. Va., early settlement, 8-431  
**Shepstone, Sir Theophilus**, in the Transvaal, 5-485  
**Sheraton, Thomas**, furniture by, 12-**\*191**, 196  
**Sheraton style furniture**, 12-**\*191**, **\*195**, 196  
**Sheridan, Philip Henry**  
   in Indian wars, 7-280  
   ride to Cedar Creek, 7-**\*260**  
**Sheridan, Richard Brinsley**, life and works,  
   main article, 13-**†205-7**  
   oratory, 13-201, 206  
   portrait, 13-**\*207**  
**"Sheridan,"** packet ship, 10-173  
**Sheriff**, county, 7-388  
**Sheriff of Nottingham**, in story of Robin Hood, 14-358  
**Sherman, James S.**, vice president of the United States, 12-456 G  
**Sherman, Roger**, American statesman, 12-**\*496**  
**Sherman, William Tecumseh**, march from Atlanta to the sea, 7-**\*263**, 264  
**Sherman Anti-Trust Act**, 7-289, 308, 315  
**Sherman Silver Purchase Act**, 12-456-C  
**Sherwood, Robert**, playwright, 13-355

- Sherwood Forest**, in story of Robin Hood, 14-353  
**Sheshonk**, king of Egypt, 5-68, 124  
**Shetland cows**, 6-486  
**Shetland Islands**, archipelago near Scotland,  
   description, 6-**†486**  
   added to Scottish domains, 6-118  
   conquered by Norway, 6-380  
   map, 6-574  
**Shetland ponies**, 4-**\*350**, **\*508**; 6-**†486**  
**Shetland sheep dog**, 4-**\*499**  
**Shetland wool**, 6-486  
**Sheyenne River**, N. D., length, 8-302  
**Shields** of soldiers, 10-**†350** fol.  
   Achilles, 10-351  
   coat of arms, 5-307; 10-354  
   Greek, 5-163  
**Shih Huang Ti**, Chinese emperor, 5-319  
**Shiites**, Islamic sect, 5-398  
**Shikoku**, island of Japan, 5-364-B  
   map, 5-593  
**Shiloh**, Palestine, battle between Hebrews and Philistines, 5-122  
**Shiloh**, Tenn., national cemetery, 8-374  
**Shiloh National Military Park**, Tennessee, 8-374  
**Shiloh, Battle of**, Tennessee, 7-260, 262  
**Shimabara massacre**, Japan, 5-356  
**Shinar**, *see* Sumeria  
**Shiner**, golden, fish, 3-**\*226**  
**Shinny**, boys' game of hockey, 14-523  
**Shinto**, religion, 5-345, 346, **\*341**  
   effort to revive, 5-359  
   priest, 5-**\*349**  
**Ship (goose) barnacle**, crustacean, 3-190, **\*191**  
**Ship-graves**, 6-375, **†376**  
**Ship money**, in Charles I's reign, 6-63  
**"Ship of the desert"** (camel), 4-**†398**  
**"Ship of Tiberius"** (Roman house boat), 5-**\*232**  
**Shipbroker**, 10-232  
**Shipbuilding**, developments, 1815-61, 7-482; 10-233  
   New England, 8-153, 169  
   New Hampshire, 8-238  
   New Jersey, 8-248  
   on the Clyde, 10-220, 222  
**Shippen, Peggy** (Mrs. Benedict Arnold), 12-487  
**Shipping Board**, United States, 7-332  
**Shipping industry**, 10-232  
**Ships**  
   annual tonnage of chief ports, 10-240  
   bridge, 10-**\*302**  
   camouflaged, 1-440  
   Chinese junk, 5-**\*327**  
   clippers, 10-172, **\*216**, 223  
   cold storage on, 10-518  
   compass, 10-**†454**, **†457**  
   earliest description, 10-161  
   early men-of-war, 10-**\*158**, **\*165**  
   government losses on, after World War I, 7-332  
   gyro, use of, 1-291  
   insurance, 7-586  
   launching, 1-**\*471**  
   light and signal warnings to ships, 10-**†226-26**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Ships—continued**

- log, 10-469  
 measured by tonnage displacement, 7-484  
 merchant marine, 10-†231 fol.  
 merchant ships, ancient Rome, 5-242  
 munitions, 10-\*415  
 oars and sails in earliest ships, 10-\*162, 163  
 packets, 10-173  
 primitive sailing ships, 10-†159-61  
 privateers, 10-\*158  
 rat guards on, 4-\*384  
 rotor, 1-\*508  
**sailing ships**, 10-†158-73  
   sea fight of, 5-\*211, 212; 7-\*210  
 shipworms' attacks, 3-155  
 square-rigged merchant vessel and its sails, 10-†171  
**steamboats and steamships**, 10-†216-24; *see also* Steamboats and steamships  
 steel, sectional view of hull, 1-\*471  
 supervision of, in foreign ports, 7-374  
 tonnage displacement makes floating possible, 1-471  
 United States, *see* United States, Navy  
 viking, 6-\*371 fol.; 10-\*164, \*360; 13-\*495  
 weather reports to, 1-278  
 wireless, use of, 10-116, 121  
 world-wide trade, 10-224  
*see also* Battleships; Galleys; Warships
- Ship's log**, 10-469  
**Shipworm**, mollusk, 3-155  
**Shire horse**, 4-\*511, 513  
**"Shirley,"** novel by Charlotte Brontë, 13-248  
**Shoals**, coral reefs on, 1-57  
**Shoals of herring and mackerel**, 3-197  
**Shock**, treatment for, 2-399, 400  
**Shock**, electric, 1-510  
   treatment for, 2-410  
**Shock absorbers**, automobile, 10-290  
**Shoebill**, bird, 4-\*11, \*195, 196  
**Shoemaker**, first in America, 9-59  
**Shoes, styles and manufacture**, main article, 9-†54-64  
   camping and tramping, 14-551, \*556  
   diver's, 10-522  
   fashions: materials, 9-54, †56-58, †60-61, 16  
   health affected by, 2-419  
   how made, 9-58 fol.  
   iron, of medieval knights, 10-354  
   Japanese footwear, 5-\*354  
   machine for manufacture, 8-\*171  
   machinery's effect on trade, 9-61  
   Massachusetts, 8-173  
   numbering of sizes, 10-374  
   price division in manufacture and sale of, 7-†532-38  
   rubberized by Indians, 9-269  
**Shoestring erosion**, 7-469  
**Shogun of Dogs** (Tsunayoshi), 5-359  
**Shogunate**, beginnings of, in Japan, 5-349, 351  
   abolished, 5-361-63  
**Sholes, C. Latham**, typewriter, 10-64
- Shooting Star** (F-80), jet plane, 10-\*368-D  
**Shooting stars**, 1-†164  
**Shophar**, musical instrument, 12-\*204, 205  
**Shoran**, radar communication system, 1-566  
**Short circuit**, electric, 1-525  
**Short-eared owl**, 4-\*165, 166, \*167  
**Short-horned grasshoppers** (locusts), 3-348  
**Short-nosed garfish**, 3-240  
**Short-nosed sturgeon**, 3-\*245  
**Short Parliament**, English, 6-63  
**Short story**; Chekhov's technique, 13-95  
   Maupassant master of, 13-134  
**Short-winged yellow locust**, 3-347  
**"Shortest Way with Dissenters, The,"** by Daniel Defoe, 13-175, 176  
**Shorthand**, 10-45  
**Shorthorn cattle**, 9-332, 334  
**Shoshone Cavern**, Wyoming, national monument, 7-419  
**Shoshone Dam**, 8-\*451  
**Shoshone Falls**, Idaho, 8-87  
**Shoshone Indians**  
   location, 8-89  
   Oklahoma, 8-317  
   "Utah" from language of, 8-396-A  
   Wyoming reservation, 8-454-A  
**Shoshonean Indians**, 8-317  
   Bannocks; Montana, 8-216  
   California, 8-36  
   Comanches; Texas, 8-381  
   language; possible derivation of "Oregon" from, 8-332  
   Oregon, 8-327  
   Utes, 8-392  
**Shostakovich, Dimitri**, composer, 12-255  
**Shot put**, sport, 14-\*475, 476  
**Shotoku**, Japanese prince, 5-346  
**Shots in billiards**, 14-†477-81  
**Shoulder**  
   movement, 2-324, \*328  
   muscles, 2-\*328  
**Shoveler**, duck, 4-119  
   color plate, 4-\*120  
**Show Me State**, 8-212-B  
**Showboats**, 12-332  
**Showmen**, biographies  
   Barnum, P. T., 12-†575  
   Cody, William F. (Buffalo Bill), 12-†573  
**"Show-Off, The,"** drama by George Kelly, 13-355  
**Shrapnel**, shell, 10-368-A  
**Shreve, Lamb and Harmon**, architects, 11-522  
**Shrew opossum**, 4-469  
**Shrews** (shrewmice), animals, 4-†278, †280-82  
   insect eaters, 4-276  
   pigmy shrewmouse, 3-70  
   water shrew, 3-\*223  
**Shrewsbury, Charles Talbot**, duke of, viceroy of Ireland, 6-155  
**Shrewsbury, N. J.**, established by Puritans, 8-251  
**Shrewsbury, Battle of**, 6-35

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Shrikes**, birds, 4-†229, \*230  
 helmet bird, of shrike family, 4-\*180  
 prehistoric, 3-53  
**"Shrimp Girl, The,"** by Hogarth, 11-\*294  
**Shrimps**, 3-†187-89  
 fresh-water, 3-257  
 Mississippi's industry, 8-205,  
 prehistoric, 3-9, 30  
**Shropshire ram**, 9-\*77  
**Shrove Tuesday**, 8-145  
**Shubad**, queen of Ur, jewelry, 12-\*117  
**Shuiski, Vasili IV**, czar of Russia, 6-428  
**Shun**, Chinese ruler, 5-316, 318  
**Shuttle**, 10-343  
**Shylock**, Shakespearean character, 13-\*157  
**Si, or Si-kiang ("West River")**, river of South-  
 western China, flowing into China Sea, 5-  
 336-A; 10-265  
 length, 10-253  
 map, 5-591  
**"Si Quaeris Peninsulam Amoenam Circum-  
 spice,"** motto of Meihigan, 8-186-B  
**Siam** (Thailand), description and history, 5-  
 †427-29; general data, 5-430-A  
 animal life, 5-430-A  
 pheasants, 4-187, \*189  
 python snake, 3-494  
 sambar deer, 4-\*409  
 area, 5-430-A  
 climate, 5-430-A  
 flag, color plate, 14-following 570, no. 63  
 government, 5-430-A  
 in World War II, 6-493  
 Japanese occupation, 5-428  
 language and literature, 5-427  
 location, 5-430-A  
 maps, 5-588, 581  
 people, 5-427, 430-A  
 physical features, 5-430-A  
 pottery, 12-\*40  
 products, 5-430-A; 9-219-A  
 rivers, 5-430-A  
**Siam, Gulf of, Asia**, 5-429  
 map, 5-589  
**Siamese cats**, 4-\*486, 488; 5-430-A  
**Sian**, China, capital of T'ang dynasty, 5-324  
**Sibelius, Jean**, 12-256  
**Siberia**, region, Asia, description, 6-428; 5-336-B  
 animal life  
 minks, 4-357  
 tigers, 4-291  
 bear festival, 6-\*425  
 becomes part of Russia, 6-427  
 climate, 5-336-C  
 emerald and other mines, 9-393, 443  
 fossil animals, 3-\*4, 5  
 fur trade, 6-428  
 map, 6-602  
 meteorite found in, 1-166  
 Samoyed used by, 4-492  
 transportation; Trans-Siberian Railway, 10-  
 185  
**Sibley, Henry Hastings**, expedition against  
 Indians, 8-193  
**Sibyl**, prophetess  
 Delphic, 5-\*148, 154  
 of Cumae, 5-\*207  
**Sibylline Books**, 5-207  
**"Sic Semper Tyrannis,"** Virginia's state motto,  
 8-418-A  
**Sicilian Vespers**, massacre, 6-298  
**Sicily**, island, Mediterranean Sea, 6-\*473, 476;  
*see also* index World War II, 6-493  
 captured by Rome, 5-214  
 French massacred in 1282, 6-298  
 given to house of Savoy, 6-303  
 map, 6-589  
**Sick Man of Europe** (Turkey), 5-413  
**Sickle**, farm implement, 10-409, \*410  
**Siddhartha Gautama**, *see* Buddha  
**Siddons, Mrs. Sarah Kemble**  
 "Mrs. Siddons as the Tragic Muse," by  
 Reynolds, 11-†2\*8  
 portrait, by Gainsborough, 11-\*301, 302  
**Side of snare drum**, 12-258-C  
**Side-necked turtle**, 3-480  
**Side stroke**, swimming, 14-\*536  
**Sideboard**  
 medieval, 12-185  
 Sheraton style, 12-\*197  
**Sidereal clock**, 1-186  
**Sidon**, capital of ancient Phoenicia, ironwork,  
 12-2  
**Siege of Pelusium**, 5-\*104  
**Siege Perilous**, in King Arthur's court, 14-382,  
 396  
**Siege towers**, 10-356, \*357  
**Siegfried, hero**, in "Nibelungenlied," 14-†310-17  
 death, 12-\*251  
**"Siegfried,"** opera by Wagner, 12-251, 296  
**Sieglinde**, character in "Nibelungenlied," 14-311  
**Siempre alegre**, plant, 7-48  
**Siempre viva**, plant, 7-48  
**Siena**, Italy, description, 11-119  
 art, 11-120  
 carved pulpit, 11-†109  
 fountain by Jacopo della Quercia, 11-120, 126  
 ironwork, 12-\*5  
 map, 5-588, C3  
 siege of 1553, 6-\*301  
**Sienkiewicz, Henryk**, "With Fire and Sword,"  
 6-450  
**Sierra**, meaning, 8-33  
**Sierra**, region in Peru, 5-518-D  
**Sierra de Chiriqui**, mountain chain, Central  
 America, 7-48-B  
**Sierra de Merida**, *see* Mérida  
**Sierra de Perijá**, mountain range, South Amer-  
 ica, 5-518-A  
**Sierra do Mar**, mountain range, South America,  
 5-518-A  
**Sierra Leone**, colony, Africa, 5-470, 471  
 map, 5-574

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Sierra Madre**, mt. ranges  
 Guatemala, 7-48-A  
 map, 7-597  
 Mexico, 7-87-B  
 Salvador, 7-48-A
- Sierra Nevada** mountain range, California, 7-343-D; 8-33, 42; 1-27  
 climate, 8-42-A  
 effect on climate, 8-232  
 map, 7-594  
 name, 8-234-B  
 Nevada, 8-234-A
- Sierra Nevada de Merida**, S. America, 5-518-F
- "Sighs, Bridge of,"** Venice, 11-\*486
- Sight, sense of**, main article, 2-†295-300, color plate, \*278  
 chart for testing vision, 2-439  
 color-blindness, 2-299  
 color vision, 1-†438-41  
 defective vision, causes: remedies, 1-†437-38  
 effect of brain injury upon, 2-389  
 effect of light upon, 2-298-99  
 farsightedness, 1-437, †438; 2-298  
 importance to good driving, 2-434, 439  
 nearsightedness, 1-437, †438  
 picture memories, 2-300  
 with one eye; with cross-eyes, 2-300  
*see also* Eyes
- Sigismund**, Hapsburg ruler, 6-249
- Sigismund**, Holy Roman emperor, reign, 6-211  
 gives safe conduct to John Huss, 13-537  
 rules in Hungary, 6-281
- Sigismund I**, king of Poland, reign, 6-449
- Sigismund II**, Augustus, king of Poland, reign, 6-449
- Sigismund III**, king of Poland, reign, 6-450  
 rule in Sweden, 6-400
- Sign languages**, 10-28
- Signac, Paul**, paintings by, 11-350  
 a Post Impressionist, 11-380
- Signal Corps**, U. S., 7-478-79  
 Air Force part of, 7-479-F
- Signals**  
 airplane markings, 10-†327  
 baseball, 14-508  
 beacon, 10-121  
 buoys, 10-†227, 229  
 driving, 2-442  
 early ways of sending, 10-†28  
 fog, 10-229  
 lighthouse, 10-229  
 semaphore code, 14-†551  
 telegraphic, 10-†95-98, 99  
 warnings to ships, 10-227, 229
- Signature**, printing, 10-\*61
- Signet rings**, 12-117, \*119, 122
- Signets**, *see* Seals, impression instruments
- Signorelli, Luca**, style, 11-143  
 "Adoration of the Wise Men," painting, 11-\*141
- Sigurd**, earl of the Orkneys, 6-147
- Sigurd**, hero, in "Volsunga Saga," 14-310
- Sigurd, Jorsalafari**, the Crusader, king of Norway, 6-384
- Sigurdsson, Jon**, wins home rule for Iceland, 6-420
- Sika**, deer, 4-\*409
- Sikhs**, politico-religious sect in India, 5-379
- Silage**, 9-335  
 action of bacteria upon, 2-20
- "Silas Lapham, The Rise of,"** by William Dean Howells, 13-332
- "Silas Marner,"** by George Eliot, 13-261
- Silent drama** (motion pictures), 10-503
- Silent trade** in New Guinea, 5-471
- Silenus and infant Bacchus**, Vatican statues, 11-\*66
- Silesia**, division of Czechoslovakia, 6-290-A  
 map, 6-583  
 won by Prussia, 6-220, 264
- Silhouettes**, how to make, 14-†12  
 game, 14-156
- Silica**  
 absorption and use by grasses, 2-178  
 batons contain, 2-68  
 fossils contain, 3-\*5, 6, 14  
 gems, 9-433  
 lime cements particles, 1-95  
 sandstone contains, 1-95  
 uses, 1-537  
 enamel manufacture, 12-63  
 glass manufacture, 9-386, 12-26
- Silicon**, element, sources and uses, 1-537  
 symbol, atomic no. and wt., 1-\*551
- Silicon dioxide**, 2-69
- Silk**, main article, 9-†36-44  
 artificial, 9-83, 10-546  
 rayon, 9-†83-86; 10-553; 1-\*554  
 by-products, 9-44  
 from cocoon to cloth, 9-†42-44  
 history of, in China, 9-36-38  
 Paterson's industry, 8-247  
 silk worm culture, 9-†38-41  
 spun by silkworm moth, 3-288, 289  
 uses, 9-44  
 rug weaving, 12-156  
 weighted, 9-43  
 woolens, use in, 9-81
- Silk cotton tree**, roots, 2-\*37
- Silk moth**, 3-288, †290
- "Silk seed,"** eggs of silkworm moth, 9-40, †41
- Silkworm**, 9-38-41; 3-\*289  
 disease of, conquered by Pasteur, 13-368  
 imitated in manufacture of rayon, 9-\*83, 86
- Silkworm moth**, 3-288, \*289
- Silo** for cattle feed, 9-\*331, 335
- Silures**, British tribe, 3-17
- Silurian period**, 3-†17-19  
 forms of life in, table, 3-64  
 rock formation, 1-\*40
- "Silva,"** meaning, 8-342
- Silver**, main article, 9-†338-90  
 coins, 9-390; 7-507  
 conductivity, 9-389

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Silver-** *continued*

- ductility and malleability, 9-389
- free coinage
  - a campaign issue, 7-292
  - Bland-Allison Act, 12-456-C
- melting point, 1-\*392
- producing regions, 9-388
  - South America, 5-518-B
  - United States, 7-343-F
  - Idaho, 8-89, \*90
  - Oregon, 8-328
  - Utah, 8-394
- refining, 9-389
- Sherman Silver Purchase Act, 12-456-C
- substances mixed with; qualities, 9-389
- symbol, atomic no. and wt., 1-\*551
- uses, 9-389
  - when mixed with gold, 9-396
- Silver, German**, 9-420
- Silver Age of Latin Literature**, 6-319
- Silver black fox**, 4-\*306
- Silver bromide**, use on photographic films, 10-449, 451
- Silver certificate**, 7-507
- Silver chloride**, glass stained with, 12-74
  - use on photographic film, 9-389
- Silver City**, New Mexico, 8-260
- Silver City by the Sea** (Aberdeen, Scotland), 6-133
- "**Silver Cord, The**," by Sidney Howard, 13-354
- Silver-haired bat**, 4-274
- Silver iodide**, used in photography, 10-448
  - used in rainmaking, 1-\*247
- Silver nitrate**, 9-389
  - effect of sunlight on, 10-446
- Silver pheasant**, bird, 4-187, \*189
- Silver plating**, 12-89, 90
- Silver State** (Nevada), 8-234-B
- Silver sword**, plant, 2-\*258
- Silverines**, people of Colorado, 8-52-B
- Silversmith**, distinction between jeweler and, 12-80
- Silversmithing**, *see* Goldsmithing and silver-smithing
- Silversmiths' guild**, medieval, 5-310
- Silverthorn**, John, 8-217
- Silverware**
  - American, 12-90, \*91
  - Italian, 12-\*85
  - Renaissance, 12-88, 90
  - Roman, 12-84
  - Sheffield plate, 12-\*89, 92
- Silverwood, F. B.**, song by, 8-42-B
- Silvery gibbon**, 4-249
- Simcoe, John Graves**, lieutenant governor of Upper Canada, 7-14
- Simnel, Lambert**, claim to English throne, 6-42
- Simon de Montfort**, *see* Montfort, Simon de
- Simon Peter**, *see* Peter, Saint
- Simon says**, game, 14-151
- Simony** committed by clergymen, 5-277

- Simoon**, desert wind, 1-228, 232
- Simple leaves**, 2-24
- "**Simple Simon**," nursery rhyme, text, color plate, 14-174-L
- Simplon tunnel**, Switzerland to Italy, 10-203, †204
- Sinaloa**, state, Mexico, map, 7-596
- "**Sinbad the Sailor**," fairy tale, text, 14-†365-71
  - tale of the roc 5-448, 464
- Sinclair, Upton**, 13-347
- Sind**, India, to be separate province, 5-387-A
- "**Sindhu**," Sanskrit word, meaning, 8-116
- Sinfonia**, overture, 12-225
- "**Sing a Song of Sixpence**," nursery rhyme, text, color plate, 14-174-C
- Sing Sing**, prison, Ossining, N. Y., 7-\*387
- Singapore**, city and crown colony at tip of Malay Peninsula, 5-426; 10-237
  - fruits, 9-\*193
  - location by Lat. and Long., 5-430-A
  - map, 5-596
  - rainfall and temperature, 5-430-A
  - trade, 9-292
- Singer, Isaac M.**, 10-444
- Singhalese**, or **Sinhalese**, race of people, in Ceylon, 5-387-B
- Singing gallery**, in cathedral, Florence, sculpture by della Robbia, 11-130, \*131-32
- Singing gallery**, in San Lorenzo, Florence, sculpture by Donatello, 11-129, \*130
- Singing** in early days; development of training, 12-244
- Singing Tower**, in Mountain Lake sanctuary, 4-517, \*3
- Sink**, Salton, 8-34, 42
- Sink holes**
  - in limestone, 1-16
  - Kentucky, 8-134
- Sinkiang**, Chinese province, Turkestan, 5-436
- Sinking fund**, 7-535
- Sinking Spring Farm**, Lincoln's birthplace, 8-138-B
- Sinn Fein**, political movement, Ireland
  - agitation for Home Rule, 6-160
  - in Anglo-Irish War, 6-161
- Sino-Tibetan language group**, 5-336-1)
- Sioux (Dakota) Indians**, 8-299, 359, 360; 7-\*104
  - calendar, 10-\*479
  - defeat at Wood Lake, 8-193
  - footwear, 9-\*60
  - headdress, 9-\*93
  - Iowa, 8-120
  - "Kansas" derived from language, 8-132
  - Minnesota, 8-190
    - reservations, 8-198-A
  - Montana, 8-216
  - Nebraska, 8-224
  - Wisconsin, 8-440
    - "Wisconsin" a Sioux word, 8-198-A
- Sioux Falls**, city, S. Dakota, 8-362
- Sioux State**, 8-302-A
- Sioux War**, 7-280

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Sipapu (Portal of Life)**, natural bridge in Natural Bridges National Monument, 7-<sup>\*</sup>420; 8-396-A
- Siphon**, tube, working of, 1-†459, 460
- Siphon, tube**  
mollusk, 3-†152  
octopus, 3-168
- Sippar**, Mesopotamia, temple to sun god, 5-87
- "Sir,"** derivation and meanings of term, 10-20
- "Sir Charles Grandison,"** by Samuel Richardson, 13-187
- Sirens**, sea nymphs, 14-421  
in the "Odyssey," 13-30  
music of, 12-254
- Sirius**, star, 1-†170, 177  
companion star to, 1-173  
Egyptian calendar run by, 10-480  
star maps  
Jan. and Feb., 1-178-B  
March and April, 1-178-1)
- Sirloin steak**, amount from steer, 9-328
- Sirocco**, desert wind, 1-231
- "Sirrah,"** derivation and meaning of, 10-20
- Sirrush**, Babylonian dragon, 5-<sup>\*</sup>97
- Sisal**, fiber, 9-285
- Sisera**, biblical character, war against Hebrews, 5-120
- Siskins**, birds, 4-<sup>\*</sup>127, 128
- Siskiwi Islands Bird Refuge**, 8-186-B
- "Sister Carrie,"** novel by Theodore Dreiser, 13-347
- Sisters, The**, extinct volcanic peak, 8-325
- Sistine Chapel**, Vatican, Rome  
paintings, 11-<sup>\*</sup>157, <sup>\*</sup>158, 162  
by Raphael, 11-167  
tapestry, 12-142
- "Sistine Madonna,"** painting by Raphael, 11-<sup>\*</sup>164, 167, 168
- Sisyphus**, mythological character, 14-455
- Sit-down strikes**, 7-<sup>\*</sup>561, 563
- Sitka**, Alaska  
government headquarters moved from 8-16-A  
headquarters of Russian-American Company, 8-11
- Sitting**, correct posture, 2-†415
- Sitting Bull**, Indian chief, battle against General Custer, 8-218
- Siva** (the Destroyer), Hindu deity, 5-372  
temple at Somnath, India, 5-373
- Six, Jan**, portrait by Rembrandt, 11-<sup>\*</sup>274, 277
- "Six's Bridge,"** etching by Rembrandt, 11-277
- Sixth sense**, muscle sense, 2-285
- Sixty Years' Captivity**, Portugal, 6-341
- Sizing**, in paper manufacture, 9-277, 280
- Skagerrack**, strait, Europe, 6-407-A  
map, 6-597
- Skagway**, Alaska, 8-16  
in gold-rush days, 8-13  
map, 8-561, M6
- Skalds**, Icelandic poets, 6-419; 14-318
- Skanderbeg III** (Ahmed Zog), king of Albania, 6-366
- Skane**, plain of, *see* Scania
- Skate**, fish, 3-195, †200  
egg purses, 3-210
- Skatemobile**, how to make, 14-†44
- Skates, ice**, 14-520
- Skating**, main article, 14-†519-20  
how to make a sail for, 14-†44  
Sweden, 6-404
- Skeg**, of boat, 14-531
- Skeleton, animal**  
bird, prehistoric, 3-†43  
coral, 3-97; 1-56  
preserved in fossils, 3-14  
snake, skull, 3-<sup>\*</sup>499  
sponge, 3-83
- Skeleton, human**, 2-†318-24  
color plates, 2-<sup>\*</sup>278, <sup>\*</sup>327
- "Skeleton in Armor, The,"** quoted, 7-112
- Skeleton shrimp**, 3-188
- Skeps**, bee hives, 3-318
- "Sketch Book,"** by Washington Irving, 13-294
- "Sketches by Boz,"** by Charles Dickens, 13-244
- Ski**, runner for use in snow, 14-†33  
how to make, of barrel stave, 14-†33  
used by maple sap gatherers, 9-<sup>\*</sup>122
- Ski troops**, Finland, 6-<sup>\*</sup>505
- Skidding**, when driving automobile, 2-440
- Skiing, sport**, main article, 14-†520-22; 2-<sup>\*</sup>417  
Canada, 2-417  
herringbone, 14-522, <sup>\*</sup>521  
New Hampshire, 8-236  
outfit for, 14-521  
physical forces at work in, 1-309, <sup>\*</sup>310  
Sweden, 6-404  
water skiing, Florida, 8-<sup>\*</sup>75
- Skim milk**, use of casein, 10-547, 552
- Skimmer**, bird, 4-204
- Skin, human**, main article, 2-†287-93  
appearance under microscope, 13-<sup>\*</sup>363  
body heat regulated by, 2-292, 342  
color pigments, 2-288, 345  
effect of ultra-violet rays on, 1-200  
evaporation, 1-393; 2-293  
feeling: nerve endings, 2-289, 291-92  
flushed, 2-292, 348, 381  
layers: depth, 2-287, <sup>\*</sup>288, <sup>\*</sup>290; 9-67  
need of fresh air, 2-341, 342  
sweat glands, 2-366, 367  
tissues, 2-†290  
treatment for infections of, 2-404
- Skin, of animals**  
amphibians, 3-416  
earliest sails made of, 10-160  
elephant, 4-338  
how turned into leather, 9-†66-72  
parchment and vellum made from, 9-274  
snake, shedding of, 3-†483, <sup>\*</sup>484, <sup>\*</sup>498
- Skin boats**, 6-<sup>\*</sup>484; 10-†137 fol.
- Skin rafts**, 5-<sup>\*</sup>94; 10-†136
- Skin tent**, 11-<sup>\*</sup>398
- Skink**, lizard, 3-<sup>\*</sup>68, 459, †460
- Skinner, Thomas**, pitcher by, 12-<sup>\*</sup>91

**Skipjack beetle** 3-338

**"Skipper Ireson's Ride,"** by John Greenleaf Whittier, 13-307

**Skippers**, insects, 3-\*404

**Skirt**, 9-5

**Skrellings**, viking name for Indians, 7-111

**Skua**, gull, 4-202, \*204; 13-\*504

**Skull**, 2-\*322

color plate, 2-\*278

diagram of section through, 2-\*387

horse, evolution, 4-\*507

movement of, in babies, 2-324

orbital cavity, 2-\*298

prehistoric man, 5-\*30

tree boa, 3-\*499

**Skunk** (polecat), 4-358, †359

**Skunk cabbage**, 2-151

**Skunk River**, Iowa, 8-124

**Sky**, main article, 1-†270-72

cause of color, 1-175, 176, \*177, 270

discovered by John Tyndall, 13-390

clouds, 1-†234-37

color of sunset, 1-220

**effect of weather upon**, 1-†270-72

seen from moon, 1-141

**Skye**, island near Scotland, map, 6-574

**Skyhook**, mining device, 9-442

**Skylark**, bird, 4-172

**"Skylark,"** by Percy Bysshe Shelley, 13-229

**Skyline Drive**, Shenandoah National Park, 7-409

**Skyscrapers**, 11-510, †515-24; 7-\*543; 9-\*386

above the clouds, 1-\*241

in modern housing developments, 9-\*385

North Dakota's capitol, 8-\*298

safe from lightning, 1-248

steel used in, 1-479; 9-380

**"Slabsides,"** John Burroughs' cabin, 13-426

**Slag**, product of smelting, 9-\*402

**Slang**, good and bad, 10-24

used in moving picture studios, 10-510

**Slap jack**, game, 14-174

**Slate**, rock, used for roofs, 9-380

formation, 1-54

quarrying: preparation for use, 9-\*382

Vermont, 8-403

**Slate pencils** of sea urchins' spines, 3-\*136

**Slater**, Samuel, 9-34

**Slaughterhouse waste**, uses, 9-328; 10-546

**Slaughtering**, modern methods, 9-328

**"Slave,"** statue by Michelangelo, 11-\*155

**Slave Coast**, Africa, 5-470

**"Slave Dynasty,"** of India, 5-373

**Slave trade**

abolished in Canada, 7-14

abolished in District of Columbia, 7-247

Africa, 5-448, 455, 468, 470

exposed by Livingstone, 13-552, 554

Madagascar, 5-464

stopped by England, 6-95

United States

Rhode Island, 8-344

**Slavery**

abolition

Denmark, 6-416

Great Britain, 6-95

Ireland, 6-145

Mexico, 7-84

Portuguese colonies, 6-342

United States, *see below under* United States

African pirate slaves, 5-454

agitation against: free colonies in Africa, 5-470

American Indians, 8-328

Canada, 7-14

enforced upon Indians by Spaniards, 5-499, 500

galley slaves, 10-164

Greece, 5-154; 7-348

Hungary: protestant pastors, 6-282

Ireland, 6-147

Mexico, 7-80, 84

Mohammedan slave market, 5-\*408

Rome, 5-229, 235, 246

artist-craftsmen, 12-179

South Africa, 5-478, 480

South America, 5-500, 509

United States

agitation before Civil War, 7-217, †244-49, 254

amendments prohibiting, 7-369

Calhoun's position, 12-521

Clay's position, 12-518

constitutional provision for representation and taxation of slaves, 7-180

Delaware refuses to ratify slavery amendment, 8-66

Dred Scott decision, 12-456-B

effect of cotton gin upon, 7-217

Emancipation Proclamation, 7-263

factor in problem of annexing Texas, 7-236

first landing of slaves at Jamestown, 7-\*256

first state to make illegal, 8-399

forbidden in Northwest Territory, 12-504

fugitive slave laws, 7-247

Georgia, 8-81

Illinois prohibits, 8-98, 102

importance to cotton industry, 7-217, 245, 246

in southern colonies, 7-153

indentured servants in American colonies, 7-152

Indiana, 8-113

introduced into Virginia, 7-123; 8-409

Jefferson's position on, 7-193

John Brown's Raid, 12-†533

Kansas, 8-128

Kansas-Nebraska bill, 12-456-E

Lincoln's attitude, 12-531

Louisiana, 8-143

Mississippi, 8-203

Missouri Compromise, 8-209

Omnibus Bill, 12-456-C

on cotton plantations, 9-28, 32

Tennessee, 8-370

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Slavery, United States—continued**

"Uncle Tom's Cabin" influences public opinion, 13-317, 319

Underground Railroad, 7-246, 248

Whittier's campaign against, 13-306

Wilmot Proviso, 12-456-E

*see also* Negroes

West Indies, 7-51, 54, 57

*see also* Serfdom

**Slavonic Dances, Dvořák's compositions, 12-309****Slavs, people, 6-424, 162-D**

Austria, 6-258

Balkans, 6-362, 364

Bulgaria, 6-368-A

Germany invaded by, 6-210

Hungary, 6-277, 286

nations formed since World War I, 6-290

Poland, 6-445

race, 5-39; 6-424

Russia, 6-443-A

South Slavs, 6-290-B

**Sled**

as a means of transportation, 10-†130 fol.

for hauling logs, 9-\*247, 251

diving sled, 10-\*523

how to make, 14-†33

maple sugar sled, 8-\*402

**Sleep, 2-339**

amount needed, 2-417

hibernation, 4-372

of plants, 2-†216-19, 16

**"Sleeping Beauty," fairy tale, text, 14-†245-47****Sleeping cars, 10-\*195, 196****Sleeping crab, 3-84, \*174, 180****Sleeping sickness**

cause, 2-\*18

germ carried by fly, 3-365

**Sleepy Hollow, Tarrytown, church, 11-\*505****Sleet, 1-251, 407****Sleeves, development of, in costume, 9-\*7, 12****Sleigh, 1-\*251; 6-\*436****Sleight of hand, *see* Tricks****Slide Mountain, New York, elevation, 8-265****Slide rule, 10-426****Slide valve of steam engine, 10-†397, 398****Slidell, John, taken from "Trent," 7-258****Sling, for injured arm, 2-\*411****"Sling," group of plants, 2-214****Sling, toy, how to make, 14-†44****Slipper limpet, mollusk, 3-145****Sloat, John Drake, American naval officer, at Monterey, 8-37, \*38****Sloe Lake, Canada, logging, 7-\*28****Sloop, sailboat, 10-171****Sloth, animal, 4-†452, 453, †456**

prehistoric, 3-\*49, 56

**Sloth bear, 4-318****Slovaks, people, Europe, 6-290-A****Slovenes, a people of Yugoslavia, 6-290-B, 363, 364****Slow loris, monkey, 4-\*268, 269****Slowworm lizard, 3-459****Slugs, of type, 10-\*53****Sluis, Battle of, 6-172****Slums, beginning of, 7-283; growth of, 7-448 clearance, 9-\*385****Sluter, Claus, carvings by, 11-\*92, \*103, 105****Smackover, Ark. oil, 8-29****Smaland Highlands, Sweden, 6-407-B****Small-eared grebe, bird, 4-\*107****Small intestine, 2-\*335, 357-58****Small-mouthed black bass, 3-238, \*239****Smallpox, inoculation against, 13-365****Smell, sense of, 2-†307-9**

animals, 3-70

ants, 2-392, 393

cats, 4-286

dogs, 4-501

easily tired; delicacy of, 2-309

odors, classification of, 2-308, *see also* Odors; Perfume

**Smelling contest, game, 14-162****Smelting**

copper, 9-\*416; 1-\*379

iron; blast furnace, 9-†400, 401, †402, †404

Pennsylvania's industry, 8-338

**Smetana, Friedrich, Bohemian composer, 12-310****Smilax, drug plant, 9-219-A****"Smile, archaic," of Greek statues, 11-40****Smith, Adam, life and works, 13-†19-21**

opinion of David Hume, 13-17

**Smith, Alfred E., presidential candidate, 7-332**

relations with F. D. Roosevelt, 12-555 D

**Smith, Donald Alexander, *see* Strathcona****Smith, Harry, Sir, 5-482****Smith, Hoke, 13-555****Smith, J. Russell, geographer, 7-578****Smith, Jedediah, explorations, 7-232****Smith, John, Captain, biography, main article, 12-†458 60; 7-121**

Jamestown colony, 12-458, 459

maps made by, 12-460

New England named by, 8-151

Plymouth named by, 8-174

Pocahontas and, 7-122; 12-458, †460

rules Virginia colonists, 7-\*121, 122

**Smith, Joseph, founder of Mormons, 8-99, 100****Smith, Lillian, lyric to "The Call of Virginia" by, 8-418-A****Smith, Roy Lamont, composer of "My Homeland, Tennessee," 8-374****"Smith," frog, 3-424****Smith Island Bird Refuge, 8-428-A****Smithfield, Fires of, Protestant martyrdom, 6-47****Smithfield hams, 8-415****Smithson, Henrietta, wife of Berlioz, 12-306****Smithsonian Institution, Washington, D. C.**

first talking machine in, 10-498

gowns of presidents' wives in, 9-\*15

**Smoke**

effect on fogs, 1-242

sunlight reflected by, 1-220

why it rises, 1-473, \*481

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**"Smoke,"** by Ivan Turgeneff, 13-93  
**"Smoke and Steel,"** by Carl Sandburg, 13-350  
**Smoke screen**  
     laid by airplane, 10-\*364  
     produced by beetle, 3-†337  
**Smoke signals,** 10-\*28, †29  
**Smoked meat,** 9-326  
**Smokehouse,** for meat, 9-\*322  
**Smokeless gunpowder,** 10-417  
**"Smoker, The,"** painting by Adrian Brouwer, 11-\*264  
**Smoking**  
     early opposition to, 9-222  
     why injurious, 9-221  
**Smoking car,** 10-\*197  
**Smoky Hill River,** U. S., 8-131  
**Smoky Mountains,** *see* Great Smoky Mountains  
**Smoky Valley,** U. S., 8-234-A  
**Smollett, George Tobias, life and works,** main article, 13-†190-91  
     portrait 13-\*190  
**Smolts,** young salmon, 3-248  
**Smothering,** treatment for, 2-410  
**Smuggling**  
     American colonies, 7-363  
     governmental efforts to prevent, 7-513  
     Spanish America, 5-501  
**Smuts, Jan,** premier of South Africa, 5-491  
     biography, 6-568  
**Smuts on plants,** due to fungi, 2-76  
**Smyrna, Turkey,** destruction of, 5-182  
**Snails, mollusks**  
     dye obtained from, 9-305  
     eggs and young, 3-260  
     pollen carried by, 2-149, 151  
     prehistoric, 3-9  
     shells, 3-†259  
     similarity of caddis worm's shell, 3-392  
     tongue, 3-482  
     water snails  
         fresh-water, 3-†258-60, \*254  
         salt water, 3-147  
**Snake, *see* Snakes**  
**Snake, constellation, star maps:**  
     Jan and Feb., 1-178-B  
     July and August, 1-178-H  
     March and April, 1-178-C, 178-D  
     May and June, 1-178-F  
**Snake Bites,** treatment for, 2-402, 408  
**Snake charmers**  
     Hindus, 3-\*486, 487, 496  
     Morocco, 5-\*450  
**Snake dance, Indian,** 7-96, \*97  
**Snake goddess, Cretan,** 11-32, \*34  
**Snake hawk, bird,** 4-157  
**Snake Island (Anguilla), West Indies,** 7-63  
**Snake-lock anemone,** 3-\*92  
**Snake-necked turtle,** 3-480  
**Snake River, U. S., Yellowstone National Park**  
     to Columbia River, Wash., 8-87 88, 454  
     Oregon, 8-331

**Snake River- *continued***  
     Washington, 8-428  
     Wyoming, 8-449  
**Snake River Plains,** 8-87, 92-A  
     eruption of lava, 1-76  
**Snake tail, starfish,** 3-133  
**Snakebird (water turkey),** 4-149  
**Snakes, main articles, 3-†482-502**  
     cause of coiling and gliding, 3-482, 495  
     constrictors, 3-†494  
     eggs and nesting, 3-\*493, \*497, 500, \*501  
     general characteristics, 3-482  
     harmless, 3-484, 498, 500  
     Ireland rid of, 14-580  
     kinds, 3-484  
     mongoose battles, 3-486, \*487  
         in St. Lucia, 7-66  
     mouth parts, 3-\*483, †484, 485, \*499, \*501  
     poison used for serum, 3-497  
     poisonous 3-484, 485, †489-94, \*497, \*501  
         first appearance, 3-57  
     shedding of skin, 3-483  
     skin used in flycatcher's nest, 4-43  
     snake charmers, 3-486, 487  
     species that bear young alive, 3-498, 500  
     swallowing victims whole, 3-484, \*496  
     zoo, 4-\*477, 479  
**Snapping turtle,** 3-\*473, †475-77  
**Snare or side drum,** 12-258-C  
**Snellen chart** for testing vision, 2-\*439  
**Snelling, Fort, Minn.,** 8-193  
**Sneyd, Honora, Major Andrew's love for,** 12-285  
**Snipes, wading birds,** 4-†114  
**Snorkel, air tube in submarines,** 10-†307 *fol.*  
**Snorri, first white child born in America,** 7-111  
**Snorri Sturluson, Prose Edda by,** 6-420  
**Snout bug,** 3-338  
**Snow, Roger Vinton, song by,** 8-156-A  
**Snow, 1-†251-54**  
     cause of, 1-251, 407  
     color changed by microorganisms, 2-15, 66  
     distribution, 1-\*256  
     glaciers begin with, 1-59  
     made by seeding clouds, 1-\*245  
     on mountains, 1-\*207; 5-443, 452, 453, 462  
     pressure turns to ice, 1-59  
     reason for color, 1-439  
     skiing in, 14-†520-22  
     snowflakes, 1-252, \*253; 10-\*487-88  
     snowshoeing, 14-\*522-23  
     usefulness, 1-\*252, 253  
**Snow-blindness, prevention of,** 1-439  
**Snow buntings, birds,** 4-126, †128  
**Snow goose,** 4-\*122  
**Snow grouse (ptarmigan), bird,** 4-230  
**Snow houses, *see* Igloos**  
**Snow leopard (ounce),** 4-\*291, 292; 5-368  
**"Snow Maiden, The," opera by Rimsky-Korsakov,** 12-313  
**Snow Mountain, Czechoslovakia,** 6-359  
**Snow petrel, bird,** 4-217

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- "Snow Queen, The,"** fairy tale by Hans Christian Andersen, 13-84, 86  
 text, 14-†221-25  
**Snow shovel**, how to make, 14-†38  
**"Snow-white and Rose-red,"** fairy tale, text, 14-†181-83  
 color plate, 14-\*182  
**"Snow White and the Seven Dwarfs,"** 14-†176-79  
 color plate, 14-\*176  
**Snowbird** (junco), 4-128, \*129  
**"Snowbound,"** by J. G. Whittier, 13-306, 307  
**Snowdon**, mountain, Northern Wales, 6-108-B  
 map, 6-572, C3  
**"Snowdrop,"** *see* "Snow White and the Seven Dwarfs"  
**Snowflake**, 1-252, \*253; 10-\*487  
**Snowflake** (bunting), bird, 4-†128  
**Snow plow**, on highways, 10-\*155  
**Snowshoeing, sport**, main article, 14-†522-23  
**Snowshoes**  
 how made and worn, 14-523  
 Indian, 9-\*60-61, \*64; 7-100, \*103  
**Snowy egret**, bird, 4-†140, †146  
**Snowy owl**, bird, 4-168  
**Snubbing brakes**, 2-441  
**Snub-nosed monkey**, 4-256  
**Snuff**, 9-222  
**Snuffboxes**, enamel, 12-\*67, 68  
**"So This Is London,"** photoplay, scene for, 10-\*507  
**Soami**, Japanese landscape gardener, 5-351  
**Soap**  
 animal products used in, 9-329  
 chemist's formulas used in manufacture, 10-550  
 oils used for, 9-312  
**Soapstone**, carved by Chinese, 12-100  
**Sobat**, river, Africa, 5-473-A  
**Sobieski, John**, *see* John III, Sobieski  
**Sobrero, Ascanio**, invents nitroglycerin, 10-416  
**Sociable weavers**, birds, 4-182  
**Social consciousness**, America's awakening through literature, 13-347  
**"Social Contract,"** by Jean-Jacques Rousseau, 13-19  
**Social Democratic party**  
 Austria, 6-275  
 Germany, 7-551  
 Russia, 6-438; 12-499-F  
**Social drama**, Ibsen, 12-333  
**Social insects**  
 ants, 3-†320-27  
 bees, 3-†297-300, †309-18  
 wasps, 3-296, †304-7  
**Social legislation and reform**, 7-439  
 England, 6-53, 54, 101  
 New Zealand, 5-540, 541  
 United States  
 pre-war years, 7-312  
 slavery, 7-263, 269  
 Wisconsin a leader, 8-445  
**Social sciences**, *see* Contents Volume 7  
**Social Security Act**, United States, 7-341-B  
**"Social Statics,"** by Herbert Spencer, 13-25  
**Social welfare work**, main article, 7-†433-44  
 Hull House, 12-580-81  
 private charity, 7-436  
 scientific charity of Rockefeller, 12-583  
**Social workers**, 7-444  
**Socialism**, 7-549-52  
 Bernard Shaw's services to, 13-271  
 communism distinguished from, 7-551  
 England, 6-557  
 Germany, 6-232, 234  
 Hungary, 6-288  
 ideas on war, 7-555  
 Italy, 6-309, 310, 312  
 John Huss's idea, 6-281  
 Port Jackson, Australia, 5-548  
 remedy for business cycle, 7-547  
 state, in ancient China, 5-327  
 utopian socialism in America, 7-244  
 votes given Norman Thomas, 7-341  
**Societies, labor**, *see* Labor, unions  
**Society Islands**, So. Pacific Ocean, 5-521, 528  
 map, 5-572  
**Society of American Artists**, 11-362  
**Society of Equitable Pioneers**, 7-553  
**Society of Jesus**, *see* Jesuits  
**Society of the Cincinnati**, Cincinnati named after, 8-307  
**Society of workers**, 7-555  
**Sociology**  
 man's obedience to law, 5-29  
 Ruskin's works on, 13-237  
**Sockets** for electric lamps, 1-527  
**Socotra**, island, Indian Ocean, 5-336-D  
**Socrates**, Greek philosopher, life and philosophy, 13-3, †4-6; bust, 13-\*4  
 Aristophanes' attack upon, 13-39, 40  
 contemporaries, 5-176  
 Sir Thomas More compared to, 13-148  
**"Socrates, prison of,"** rock cavern, 5-\*178  
**Soda**, in glass manufacture, 12-26, 29  
**Soda water**, invention, 13-379  
**Södermalm district** of Stockholm, 6-400  
**Sodium**, element  
 atomic structure, 1-\*541, 542, \*544  
 chemical behavior, 1-547, 551  
 Davy separates, 13-385  
 isolated from solution, 1-500  
 product of electrochemistry, 10-549  
 salt contains, 1-44, 357  
 spectroscopy reveals, 1-187  
 spectrum, 1-441  
 symbol, atomic no. and wt., 1-\*551  
**Sodium carbonate**, chemical, 10-548  
**Sodium chloride** (salt), 1-357; 9-413; *see also* Salt  
**Sodium fluoride**, formation, 1-\*544  
**Sodium hydroxide**, obtained by electrolysis of salt, 1-558  
**Sodium nitrate**, nitrogen content, 10-546

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Sodium vapor lamp**, 10-548
- Sofas**, 12-176, \*191, \*195
- Sofia**, Bulgaria  
geographical link with Macedonia, 6-368-A  
rainfall and temperature, 6-368-A
- Soft coal**, 9-438  
Appalachian Plateau, 7-343-C  
Montana, 8-218  
Utah, 8-395
- Softness and loudness of sound**, 1-448, 449
- Soft-shelled turtle**, 3-\*479, 480
- Soga**, Japanese prime minister, 5-345
- Sogne Fiord**, Norway, 6-372
- "Sohrab and Rustum,"** by Matthew Arnold, 13-255
- Soil**, formation, main article, 1-†94-97  
and food supply of plants, 2-41 fol.  
animal and plant life in, 1-97  
chemical analysis, 10-545  
conservation of, 7-465 fol.  
dry farming; effect of, 8-383  
effect of alkaline or sandy, upon plants, 2-45  
elements plants need, 10-545-46  
erosion, 7-468  
fertilizers, 10-545-46; *see also* Fertilizer  
glacial, 1-†97  
in earth's crust, 1-40  
kinds, 1-96  
leaching, 7-470  
loess, 8-223; 6-368-A  
made by lichens, 2-80  
made from rocks, 2 20  
Minnesota; result of glacial action upon, 8-190  
new, result of decomposition, 3-4
- Soil Conservation Service**, 7-470
- Soilless farming**, *see* Soilless gardening
- Soilless gardening**, 9-154
- Soja** (soybean), 9-214
- Solar spectrum**, 1-†187
- Solar system**, 1-105, 150, \*7  
centrifugal force acting in, 1-311  
chart giving general data, 1-106  
color plate, 1-98  
Copernicus' discoveries, 13-394  
governed by laws of motion, 1-309, 311  
origin and formation  
Nebular Hypothesis, 1-\*5, 6  
Planetesimal Hypothesis, 1-9  
probable origin, 1-280  
tidal theory, 1-†7  
perpetual motion in, 1-319  
planetary motion, 1-†288-90  
Descartes' theory, 1-15  
Kepler's laws, 13-399  
universal gravitation, 1-14  
*see also* Meteorites; Planets; Sun, etc.
- Solder**, metal, 9-420; 1-\*392
- Soldiers**  
Swiss, 6-250  
trained to use skis, 14-520  
*see also* United States Army
- Soldiers' and Sailors' Monument**, Indianapolis, Ind., 8-\*110
- "Soldier's Dream, The,"** painting, 12-\*535
- Soldier's Memorial**, Indianapolis, 8-111
- "Soldiers Three,"** by Rudyard Kipling, 13-269
- Sole**, fish, 3-202
- Sole of shoe**, 9-63, 64
- Solemn League and Covenant**, in English Civil Wars, 6-127
- Solemnity**, game, 14-157
- Solen**, mollusk, 3-153
- Solenodon**, animal, 4-\*280
- Solenoid electromagnets**, 10-490
- Solesmes**, France, monastery, sculpture from, 11-\*93
- Solferino, Battle of**, 7-426
- Solidification of liquids**, 1-407
- Solids**, 1-403  
arrangement of molecules in, 1-\*403, 404  
compared with liquids and gases, 1-403, 535  
conduction of sound, 1-446, 447  
difference between liquids and solids, 1-354  
elements among, 1-535  
expansion and contraction, 1-\*476, †477-81  
volume and weight, 4-†467-74
- Solitary vireo**, bird, 4-60
- Solitary wasp**, 3-307
- Solomon**, king of Israel, character; reign, 5-123  
marries Egyptian princess, 5-69  
temple at Jerusalem, 5-123, 125  
visit from Queen of Sheba, 5-394; 12-175
- Solomon Islands**, Pacific Ocean, 5-†527, 528  
animals, 4-274, \*77  
inhabitants, 5-521  
map, 5-572
- Solomon River**, Kansas, 8-131
- Solon**, Athenian lawgiver, life, main article, 12-†336-37  
received by Croesus, 5-\*102; 12-\*336  
rules Athens, 5-159
- "Solon,"** meaning of word, 5-160
- Solstice**, explained, 1-203
- Solutions**, chemistry, 1-557  
ions in, 1-558
- Solway Firth**, inlet, Scotland, map, 6-575
- Solyman I, the Magnificent**, sultan of Turkey, 5-412  
storms fortress of Szioetvár, 5-\*413
- Somali race**, 5-458
- Somaliland**, territory, Africa, 5-457  
formerly called Punt, 5-63  
maps, 5-576, 579
- Somers, Sir George**, Bermuda colony founded by, 6-490
- Somersaults of diver**, 14-†539
- Somerset, Charles, Lord**, governor of Cape Colony, 5-480
- Somerset**, county of, Maine, 8-152
- Somme**, river, France, map, 6-579
- "Son of Heaven,"** name for Chinese emperors, 5-318

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- "**Son of Re**," title of Egyptian king, 5-56  
**"Son of the Middle Border, A,"** by Hamlin Garland, 13-346  
**Son-of-the-sun**, frigate bird, 4-214, \*215  
**Sonata**, musical composition, 12-234-36  
     distinguished from sonata-form, 12-234  
     in hands of Beethoven, 12-240, 241  
     perfected by Haydn, 12-274  
**Sonata-form**, music, 12-234, 235  
     distinguished from sonata, 12-234  
     perfected by Haydn, 12-235, 274  
**Sonderbund**, Swiss league, 6-254  
**Song**, closely linked with drama and dance, 12-327  
**"Song,"** metal plaque on Radio City Music Hall, 12-\*327  
**Song festivals**, Esthonia, 6-463  
**Song-Koi (Red River)**, Southwestern China and Tongking to Gulf of Tongking, 5-430-B  
     map, 5-588  
**"Song of India,"** by Rimsky-Korsakov, 12-313  
**"Song of Louisiana,"** 8-146-A  
**"Song of Roland,"** French epic, 6-169  
     retold, 14-†337-42  
**"Song of the Chattahoochee, The,"** poem by Sidney Lanier, 13-335  
**"Song of the Green Mountains,"** by John F. Howard, 8-404  
**"Song of the Lark, The,"** novel by Willa Cather, 13-352  
**Song sparrow**, 4-†85  
     disposition, 4-\*2, 86  
     winter braved by, 4-126  
**Song thrush**, 4-171  
**Song tournaments** of minnesingers, 12-216  
**Songs**  
     patriotic, 12-242  
     Schubert the greatest writer of, 12-243, 284  
     *see also* Folk music  
**"Songs before Sunrise,"** by Algernon Charles Swinburne, 13-259  
**"Songs from Vagabondia,"** by Bliss Carman, 13-579  
**"Songs of Experience,"** by William Blake, 13-212  
**"Songs of Innocence,"** by William Blake, 13-212  
**"Songs without Words,"** by Mendelssohn, 12-246, 288  
**Sonnet**, poetic form, introduced into England, 11-214  
**"Sonnets from the Portuguese,"** by Elizabeth Barrett Browning, 13-253  
**Sonora**, state, Mexico, map, 7-596  
**Sooner State**, 8-320-B  
**"Sooners,"** in Oklahoma, 8-318  
**Sooty vapor**, Galen's term for carbon dioxide, 2-333  
**Sophia**, sister of Czar Feodor, 6-429  
**Sophists**, Greek, 5-171  
**Sophocles**, Greek dramatist, life and works, main article, 13-†35-36  
     adds third actor to drama, 12-325  
**Sophocles**, Greek dramatist *continued*  
     contemporaries, 5-172  
     stimulated by Pericles, 12-343  
**Sora rail**, bird, 4-109  
**Sorbonne**, University of Paris  
     Library of, 10-556  
     Pasteur and Lister honored, 13-\*368  
**"Sorcerer, The"**  
     operetta by Gilbert and Sullivan, 12-320  
     prehistoric sculpture, 5-32  
**"Sordello,"** by Robert Browning, 13-252  
**Sorebacks**, nicknames for Virginians, 8-418-A  
**Sorghum**s, grasses, 9-120  
     products of, 9-314  
**"Sorrows of Werther, The,"** by Goethe, 13-281  
**"S O S,"** wireless distress signal, 10-120  
**"S. O. S.,"** by Leonid Andreiev, 13-97  
**Sosua**, Santo Domingo, refuge colony, 5-141  
**Sothel**, Seth, governor of North Carolina, 8-288  
**Soto**, Hernando de, *see* De Soto, Hernando  
**Soufrière**, volcano, Montserrat, West Indies, 7-63  
**Soufrière**, volcano, St. Vincent, West Indies, 7-66  
**Souillac**, France, church, pillar detail, 11-\*87  
**Soul**, in Greek philosophy, 13-3, 4, 6  
**Sound**, nature and behavior, main article, 1-†443-50  
     broadcasters' devices for imitating, 10-\*121-1  
     captured by phonograph, 1-443, 10-497  
     cause of loudness and softness, 1-499, 450  
     changed into light, 10-504, \*506  
     conductors, 1-†445, 446  
     echo, 1-\*443, 446  
     example of periodic motion, 1-287  
     how radio reproduces, 10-117  
     pitch variation, 1-†448-49  
     produced by insects, 3-292, 337, 345-49, 372  
     quality, 1-450  
     reproduction by electric current, 10-110, 116  
     signals sent to ships, 10-229  
     speed, 1-†445, †446  
     transmission through telephone, 1-†519  
     waves  
         set up by vibration, 2-305  
         traveling through ear, 2-†303  
         why none on moon, 1-138  
     *see also* Hearing  
**Sound pictures**, moving pictures, 10-504, \*506  
**Sound pictures**, writing  
     Egyptian hieroglyphics, 10-38  
     Semitic alphabet, 5-112  
**Sound-proofing**, 1-447, 10-121-B  
**Sound waves**  
     set up by vibration, 2-305  
     traveling through ear, 2-†303  
     *see also* Sound  
**Sounder**, nautical instrument, 10-\*105  
**Sounder**, telegraphic instrument, 10-\*97  
**Sounding balloons**, 1-\*259, 372  
**Sounding board**, of piano, 1-449  
**Soup factories**, Camden, N. J., 8-245, 247  
**"Souris,"** French word, meaning, 8-302

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Souris**, Canada, fishing station, 7-20

**Souris River**, *see* Mouse River

**South, the**, section of United States

agriculture, 7-463

attitude toward tariff and nullification, 7-225

Civil War, 7-252-65

colonial life, 7-153

conditions before 1850, 7-245, 246

cotton growing, 10-404

mechanizing cotton fields, 9-26

effect of Industrial Revolution and cotton gin, 7-217

Federal troops withdrawn, 7-286

Indiana's sympathizers during war, 8-113

plantations, 8-408, 410, 7-153, 246

disappearance, 8-415

Negro life, 9-228

North Carolina, 8-293

Reconstruction, 7-267-74

secession, 7-250, 253

slavery, *see* Slavery

South Carolina's leadership, 8-352, 354

textile industry, 7-343-F; 8-239

vegetation, 7-343-E

*see also* Confederate States of America

**South Africa**, Union of, description and history,

main article, 5-2475-91; general data, 5-491-B; *see also* index World War II, 6-493

animal life, 5-475

caracul, 4-296

jackal, 4-302

area, 5-491-B

climate, 5-491-B

flag, 5-491

color plate, 14-following 570, no. 65

geraniums discovered in, 2-229

government, 5-491-B

history, 5-2475-91

Boer republics admitted, 5-489

Boer Wars, 5-486, 487; 6-101, 7-28

colonies and their government, 5-477-82

English rule, 5-470, 482

formation of the Union, 5-482

"Great Trek," 5-481

immigration from India, 5-490

race problem, 5-489, 490-91

settlement; Dutch rule, 5-477-79

languages, 5-491

location, 5-491-B

map, 5-577

people, 5-491-B

native tribes, 5-475, 478 fol

physical features, 5-491-B

primitive dwellings, 11-399; 5-489

products and industries

agriculture; corn, 9-104

coal, 9-438

copper, 9-419

diamond fields, 9-429, 430; 5-485

gold, 9-391; 5-488

mineral deposits, 5-491-B; 9-426

**South Africa**, products—*continued*

olive growing, 9-213

silver, 9-389

wool, 9-81

slavery, 5-478, 480

trade, 5-479; 10-238

diamond, 9-429, 430

transportation, 10-224, \*132

**South African Republic** (the Transvaal), 5-486-89

**South African War**, *see* Boer Wars

**South America**, continent, description and

history, main article, 5-2493-518; general data, 5-518-A-518-C; *see also* index World War II, 6-493

agriculture, 5-494, \*501, \*505

altitudes, highest and lowest, 1-25

animals, 5-518-C; 4-252, \*262-67

archaeology, 5-495, \*503

area and location, 5-518-A

climate, 5-518-A, 493

communication problem, 5-516

culture, 5-512

divisions, 5-518-B

explorers, 5-496

Americus Vesputius, 13-457

Humboldt's search for specimens, 13-423

Magellan, 13-463

Raleigh, 13-480

"Good Neighbor" policy, 5-518

history, 5-2493-518

**Indian and Spanish civilizations**, 5-2493-501

Spanish exploration and conquest, 7-116, 119

Papal Line of Demarcation, 5-496

Spanish rule, 5-496-501, 503

Portuguese rule, 5-496, 500, 501, 507

Spanish districts in, 5-500

end of Spanish rule, 12-437-38; 5-506

**after 1800: republics**, 5-2503-18

boundary troubles, 5-507, 510, 512, 517

revolutions and wars, 6-333; 5-504, 507, 509, 510

Constitutions of republics, 5-512, 514, 517

"A B C" powers, 5-515

resentment toward Monroe Doctrine, 5-518

Pan-American Union, 5-518

"Good Neighbor" policy, 5-518

interesting facts, 5-518-C

islands, 5-518-A

language, 5-518-B

maps, 5-603, 605, 572

people, 5-518-B

physical features, 5-518-A, 493

population, 5-494

products and industries

cattle raising, 5-505

minerals, 5-518-B

coal deposit, 9-438

natural resources, 5-404

rubber, 9-263, 271; 5-496

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- South America**, products—*continued*  
 silver, 9-389  
 wool, 9-75  
*see also* South America, agriculture  
 religion, 5-518-B  
 rivers, 5-518-A  
 slavery, 5-499, 500, 509  
 trade, 10-240-41  
 transportation, 10-200, 224, 267  
 river, 10-267  
 vegetation, 5-518-B  
*see also* America and names of South American countries, as Argentina; Brazil
- South America, United States of**, dream of Bolivar, 5-506
- South Australia**, state, Australia, 5-554, 556, 558  
 member of Commonwealth of Australia, 5-560-L
- South Bend**, Ind.  
 industries, 8-114  
 Notre Dame University, 8-109
- "South Carolina,"** song, 8-356-A
- South Carolina**, state, U. S., description and history, main article, 8-349-55; general data, 8-356-356-B  
 agriculture, 8-†354  
 animal life  
   bats, 4-274  
   toads, 3-426  
   turtles, 3-473  
 area, 8-356  
 capital and capitol building, 8-349  
 charities and correction, 8-356  
 cities, towns, list, 8-350, \*353, 355, 356-A  
 climate, 8-356  
 counties, list, 8-356-A  
 education, 8-355  
   institutions of higher learning, list, 8-356  
 flag, 8-356-A; 14-574  
 Fundamental Constitutions, 8-350  
 highlanders and lowlanders, 8-352  
 history, 8-349-52  
   Civil War, 8-354; 7-255  
   proprietary colony, 7-130; 8-350  
   Revolutionary War, 8-352  
   signs Declaration of Independence, 7-173  
 holidays, 8-356-A  
 Indians, 8-350  
 location, 8-356  
 map, 8-544  
   on United States map, 7-595  
 monuments, 8-356-A; 7-412  
 motto, 8-356-A  
 name, 8-356-A  
 nicknames, 8-356-A  
 nullification, 7-224  
 physical features, 8-356  
 political facts, 8-356  
   early governmental document, 8-350  
   products and industries, 8-351, 354, 355  
   rivers, 8-356  
   state bird, 8-356-A
- South Carolina**, state, U. S.—*continued*  
 state flower, 8-356-A  
 state song, 8-356-A
- South Carolina, University of**, 8-350  
 library, 8-350
- South Carolina College**, *see* South Carolina, University of
- South China Sea**, Asia, maps, 5-596, 581
- "South Dakota,"** song, 8-364-A
- South Dakota**, state, U. S., description and history, main article, 8-†358-63; general data, 8-364-364-B  
 agriculture, 8-359, 361  
 climate for, 8-364  
 products, 8-361  
 water supply, 8-362  
 area, 8-364  
 capital and capitol building, 8-358  
 charities and correction, 8-364  
 cities, towns, list, 8-361, 364-A  
 climate, 8-364, 358  
 counties, list, 8-364-A  
 droughts, 8-362  
 dust bowl, 8-362  
 education, 8-361  
   institutions of higher learning, list, 8-364  
 flag, 8-364-A  
 fossils, 8-359, 360; 3-15  
 Glacial Age, 1-†61  
 history, 8-359-61  
   admitted to Union, 8-361  
   included in Minnesota Territory, 8-193  
   included in Wisconsin Territory, 8-442  
 holidays, 8-364-A  
 Indians, 8-359, 360  
   modern Indians and reservations, 8-364-A  
 location, 8-364  
 map, 8-546  
   on United States map, 7-594  
 monuments, 8-364-A  
   Fossil Cycad National Monument, 7-419, 420; 8-364-A  
   Jewel Cave, 7-417; 8-364-A  
 motto, 8-364-A  
 name, 8-302-A  
 nicknames, 8-364-A  
 parks, 8-364-A  
   Wind Cave National Park, 8-364-A; 7-409  
 physical features, 8-358, 364  
 political facts, 8-364  
 products and industries, 8-361  
 reservations, 8-364-A  
 rivers, 8-359, 362  
 state bird, 8-364-A  
 state flower, 8-364-A  
 state song, 8-364-A  
 transportation, 8-361  
 water supply, 8-362
- South Dakota, University of**, Gymnasium and armory, 8-359
- South Downs**, England, 6-108-B

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**South Georgia**, island in S. Atlantic, 6-492  
discovered by Captain Cook, 13-506  
map, 5-572

**South Island**, New Zealand, 5-541-B  
map, 5-599

**South Manchester**, Conn., 8-60

**South Mountains**, Pennsylvania, 8-340, 341

**South Orkney Islands**, South Atlantic Ocean  
map, 13-502-B

**South Park**, Colo., 8-52-A

**South Platte River**, U. S., 8-52-A

**South Pole**, Antarctic regions, 13-503

covered with ice, 1-61

discovery, 13-508, 510, 512

exploration and search for, 13-†503-12

Captain Cook's voyage, 13-489

map, 13-502-B

mountains, 1-27

soundings in region of, 1-†64

see also Antarctic regions; Polar regions

**South Sea Bubble**, 6-†76

**South Sea Islands**, Pacific Ocean, description  
and history, 5-†526-29

basket weaving, 12-130

map, 5-572

native costumes, 9-†5

products, 5-526

shells, 3-†141

**South Sea kingfisher**, 4-†50

**South Seas**, Captain Cook's explorations, 13-  
†488-90

**South Shetland Islands**, Antarctic Ocean, map,  
13-502-B

**South Slavs**, division of Slavic peoples, 6-290-B

**South temperate zone**, 1-204

**Southern Alps**, mountain range on South Is-  
land, New Zealand, 5-541-B

**Southern Cross**, constellation, 1-178

**Southern Fish**, constellation, star maps:

Nov. and Dec., 1-178-I.

Sept. and Oct., 1-178-J

**Southern Hemisphere**, 5-518-B

map made by Captain Cook, 13-490

**Southern (Upper) Kingdom**, Egypt, 5-51

**Southern branch of white race**

end of domination by Semites, 5-97, 99

Latin peoples, 5-44, †45

**Southern Rhodesia**, region, So. Africa, map,  
5-577

**Southern Sea**, name for Pacific Ocean, 13-459

**Southern states**, see South, the

**Southey, Mrs. Robert**, 13-220

**Southey, Robert**, life and works, main article,  
13-†219-20

and Wordsworth, 13-216

cited, 9-134

friendship with De Quincey, 13-233

**Southside Virginia**, 8-418

**Southwest**, section of United States

birds, 4-†140-47

Indians, 7-†92-97; 9-†386

**Southwest—continued**

Joshua tree, 2-†IX

memorials of Spanish days, 7-†234

won by Mexican War, 7-238

**Southwest Africa**, general data, 5-491-B

area, 5-491-B

climate, 5-491-B

conquered by Boers, 5-491

government, 5-491-B

location, 5-491-B

map, 5-577

people, 5-491-B

physical features, 5-491-B

see also Africa

**"Souvenir of Solferino, The,"** by Henri Du-  
nant, 7-428

**"Sovereign of the Seas,"** British man-of-war,  
10-†158

**"Soviet,"** meaning of word, 6-443

**Soviet government** in Russia, 6-†439-43; see  
also Union of Soviet Socialist Republics

**"Sower, The,"** painting by Millet, 11-334

**"Sower, The,"** statue, 2-†213

**Soybean**, 9-214-214-B; 8-102, 123

chemical industries use oil, 10-546

products, 9-214-214-A

**Space, curved**, 13-409

**Space ship**, rocket, 10-†365

trip in, 1-†136-43, †299-301

**Space-time**, fourth dimension, 13-409

**Spadix**, of flower, 2-151

**Spain**, country, Europe, **description and his-  
tory**, main article, 6-†317-35; general data,  
6-342-A-342-B

see also index World War II, 6-493

agriculture, 7-451; 6-342-B

area, 6-342-A

art, 11-†241-58, †306-9

bronze work, 11-†246

famous painters

El Greco, 11-†243 fol.

Goya, 11-†306 fol.

Velasquez, 11-247 fol.

Moorish influence, 11-84, 241

see also crafts below

cities; shipping, 10-259

climate, 6-342-A; 11-241

northern coast, 1-225

colonization and conquest in New World,

see below overseas dominion

Constitution, 6-332, 334, 335

costume

helmet, 10-†355

princess, 9-†9

crafts

enamel, 12-†65

laces, 12-†165, †167, 172

pottery, 12-56

tapestries, 11-308

flag color plate, 14-following 570, no. 59

government, 6-342-B

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Spain—continued****history, 6-†317-35****to 1516, 6-†317-23**

Stone Age people, 6-317

Carthaginians in, 5-214

earliest rulers, 6-318-19

Visigothic kingdom, 6-319

Jews in, 5-134, 136

Moors, 6-320-23; 5-292

battle at Roncevaux, 14-337

rule of Portugal, 6-338, 341

assistance given Columbus, 6-323; 7-114

discovery and loss of the West Indies,

7-50, 51

sea power, 10-169

**1517 to present, 6-†325-35**

Golden Age under Phillip II, 13-73

treatment of Flanders, 11-217

war with England, 6-56

Hapsburg rule, 6-325

time of greatest glory, 6-325, 327

Bourbon rule, 6-†329

Napoleon's activities, 6-331 fol

French enter Madrid, 11-\*306, 309

throne seized by Napoleon; revolution-  
ary juntas, 5-504

Andorra's victory over, 6-468

republic established, 6-335

fascist uprising against government, 7-555

civil war and dictatorship, 6-335

refugees, 6-\*499

language, 6-319

literature, 13-†73-80

location, 6-342-A

maps, 6-591

on map of Europe, 6-570

overseas dominion

African possessions, 5-\*444, 448, 451, 454,  
455

Canary Islands, 6-491

Guam lost and won, 8-472

New World history, part in

Bartolome Ferrello, 8-326

California, 8-36, 37

Drake's defeat of the Armada, 12-405

explorations and conquests, 5-545; 7-  
†113-19, \*230, \*234

conquest of Mexico, 13-†467-70

division and government of possessions;

Council of the Indies, 5-500

end of rule in America, 5-506

Florida, 8-69

granted French possessions, 7-143

Idaho claimed, 8-88

loss of Mexico, 7-82

loss of Porto Rico, 7-297

Louisiana, 8-142

Minnesota territory acquired, 8-191

New Mexico, 8-258-59

New Spain; rule of Mexico, 7-73-76, 78-81

income from New Spain, 7-79

Oregon, 8-326

**Spain, overseas dominion—continued**piracy directed against Spanish rule, 7-  
42; 10-170

rule in Central America, 7-42

rule in South America, 5-503 fol.

Texas country, 8-377, 378

treatment\* and loss of Cuba, 7-56, 73,  
294, 297

war with Peru, 5-510

rule in, and sale of, Philippines, 5-564-69;  
7-297

peasant types, 6-\*330

people, 6-342-B

believed to be gods by Mexicans, 7-70

cruelty to Indians, 5-†498, 500; 7-76, 79

horse introduced into America by, 4-514

introduce peach into America, 9-168

introduce pineapple into Philippine Is-  
lands, 9-186Sir Walter Raleigh's treatment of, 13-479,  
480

take gold from the New World, 9-392

physical features, 6-342-A

possessions

Africa, 5-473-B

map showing, 5-\*444

products and industries, 6-342-B

cinnabar, 9-416

coal, 9-438

cochineal, 9-305

cork, 9-296

mercury, 9-416; 1-538

mines, 6-319

olive industry, 9-213

orange growing, 9-172, 173

paper making, 9-274

rope manufacture, 2-180

silk, 9-38

silver, 9-389

provinces, 6-342-B

race, 5-39, 44

rivers, 10-259; 6-342-B

Roman Catholic church, 6-327, 334

Inquisition, 6-323, 327 fol.

persecution of Protestants in Netherlands,  
6-\*347, \*350, 354

slave trade, 5-148

teach crafts to Orkney Islanders, 6-487

theater, 13-78

trade

China, 5-354

early commerce, 6-318

Japan, 5-356

merchant marine, number, 10-232

New World, 5-501

shipping points, 10-259

with Malays, 5-426

transportation, 6-342-B

ox cart, 10-\*143, \*144

**Spalding, Henry, 10-148****Spallanzani, Lazzaro, life and work, 13-†370-71****Span, measure, 10-373**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Span** of bridge, 10-210, 213
- Spaniards**, *see* Spain, *subhead* people
- "Spaniards,"** nickname for people of New Jersey, 8-252-A
- Spaniels**, dogs, 4-\*496, \*499, 503
- Spanish-American War**, 7-†294-97; 6-334
- Cuba cause of, 7-56
- Dewey's victory at Manila Bay, 12-†540-41; 7-296, 297
- marines' part in, 7-493
- naval officer's uniform 7-\*483
- navy's part in, 7-483
- patriotism a result of, 7-302
- Pershing's part in, 12-554
- Protocol of Peace, 7-302
- Spanish architecture**, Moorish, 11-449, \*451
- Spanish Armada**, *see* Armada
- Spanish art**, *see* Spain, art
- Spanish bayonets**, plants, 2-151
- Spanish blonde**, lace, 12-\*167, 172
- Spanish cedar**, tree, 9-258
- Spanish-Filipino Association**, 5-568
- Spanish grass** (esparto), 9-290
- Spanish in New World**, *see* Spain, *subhead* overseas dominion
- Spanish language** an outgrowth of Latin dialect, 6-319
- Spanish literature**, in work of great writers, 13-†73-80
- Spanish Main**, 10-170
- pirates, 7-†51, 54
- Spanish missions**, *see* Missions
- Spanish Rebellion**, 6-335
- Spanish State**, 8-262-A
- Spanish style of architecture**, California, 7-\*384
- Spanish Succession, War of the**, 6-184, 219, 331
- Marlborough's victories, 6-75
- Spanish Trail, Old**, 8-393
- Spanker**, sail, 10-\*171
- Spano, Pippo**, portrait by Andrea del Castagno, 11-\*136, 137
- Spark**, electric, 1-\*513
- Spark plug** of automobile, 10-†285
- Sparkler**, beetle, 3-\*334
- Sparrow Hawk**, character in Arthurian legends, 14-384, \*385, 386
- Sparrow hawk**, bird, 4-154, 175
- Sparrows**, 4-†23-25, †84-86
- graph of song, 4-\*5
- Java sparrows, 4-182
- nest building and breeding, 4-84, 85
- swamp sparrow, 4-101
- number of clans; how to distinguish, 4-83, 25
- similarity of male and female, 4-85
- varieties that damage crops, 4-136
- winter braved by, 4-126
- see also* names of varieties, *as*, Chipping sparrow
- Spars**, women's Coast Guard aux. corps, 6-\*521
- Sparta**, ancient Greek city-state, 5-153
- education, 5-155
- jealousy of Athens, 5-166
- market place, 5-\*176
- Sparta---continued**
- people
- character and life, 5-154
- hardihood, 5-155, 163
- heroism at Thermopylae, 5-\*163, 164
- money made of iron, 12-2
- Plutarch's admiration of, 13-44
- simplicity of life, 12-178
- rules Greece, 5-175
- war with Athens, 5-168, 173
- Spartanburg**, S. C., national battlefield site, 8-356-A
- Spat**, young of oyster, 3-160
- Spathe** of flower, 2-\*150, 151
- Spawn** of frog, 3-†17, 418
- "Spear Bearer,"** sculpture, by Polyclitus, 11-\*39, 43
- Spearfish**, 3-\*202, 205; 9-\*366
- Spears**, weapons, 10-†350, \*355, \*356, \*359
- Specialization in labor**, *see* Division of labor
- Species**, botany, 2-183
- "Species, On the Origin of,"** by Charles Darwin, 13-436
- Lyell's part in, 13-431
- "Species Plantarum,"** by Linnaeus, 2-185
- Specific gravity**, 1-†474
- gold, 9-392
- hydrometer measures, 1-†474
- Spectacle bear**, 4-317
- Spectacled cayman**, reptile, 3-445
- Spectacled cobra**, snake, 3-†485
- Spectacled owl**, 4-\*166
- "Spectator,"** publication of Addison and Steele, 13-181, 182
- Specter of the Brocken**, 1-\*425
- Specter shrimp**, 3-188
- "Specter's Bride, The,"** cantata by Anton Dvořák, 12-309
- Spectrogram**, 10-494
- Spectroheliograph**, 1-118
- Spectroscope**, construction and operation, 1-\*440, 441
- analysis of light rays by, 1-185, †187
- Spectrum**, color plate, 1-434, 438, 441
- continuous; discontinuous, 1-187
- Fraunhofer lines, 1-\*185, \*187
- light rays in, 10-495
- of chemical substances, 1-187
- of sun, 1-†187
- Speech**
- freedom of, *see* Speech, freedom of
- sent across ocean, 10-121
- theories of origin, 10-†1-3
- transmitted by radio, 10-118, †120
- transmitted by telephone, 1-†519-20; 10-109
- fol.
- see also* Language and languages
- Speech, freedom of**
- curbed in United States by Criminal Syndicalism Laws, 7-334
- granted by U. S. Constitution, 7-368

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Speed**, in driving automobile, 2-436-39, 440-41  
regulation, 10-†289
- Speed roadster**, toy, how to make, 14-†38
- Speedometers**, 10-426, \*440
- Speed-up plan**, Russia, 6-442, 443
- Speedways**, *see* Roads
- Speke, J. H.**, African explorer, 5-448, 462
- Spencer, Herbert**, life and works, main article, 13-24-25  
portrait, 13-\*25
- Spenser, Edmund**, life and works, main article, 13-†149-50  
describes Irish misery, 6-153
- Sperm**, fluid (botanical), 2-\*83, \*89, 104
- Sperm case**, of liverwort, 2-84
- Sperm whale**, 4-\*443, †46  
enemy of squids, 3-171, †172
- Spermaceti** of whale, 4-446  
used for candles, 10-389
- Sperry, Elmer A.**, invents gyrocompass, 10-457
- Sphagnum**, moss, 2-85
- Sphairistike**, game, 14-467
- Sphere**, frequent occurrence in nature, 10-437
- Spheres**, music of, 1-169
- Spheres, concentric**, Chinese carving, 12-98
- Sphinx**, Egyptian, 11-\*16, †412; 5-\*47  
Great Sphinx at Gizeh, 5-†55; 10-481; 11-10, \*413
- Sphinx**, Greek monster  
furniture decoration, 12-\*178  
riddle of, 14-†444
- Sphinx moth**, 3-†288
- Spica**, star, star maps:  
July and August, 1-178-H  
March and April, 1-178-D  
May and June, 1-178-F
- Spice Islands**, *see* Moluccas
- Spice trade**, 9-206; 7-434
- Spices**, main article, 9-†206-9  
used in Middle Ages, 5-304  
*see also* Seasoning
- Spicules** of sponge, 3-83
- Spider crab**, 3-†84, 181, \*183
- Spider monkey**, 4-262, †263
- Spiders**, main article, 3-†406-13, \*69  
cocoon, 3-\*408, †410  
courtship, 3-407, 411  
difference between insects and, 3-406  
eggs and hatching, 3-†406, †407  
first lace makers, 12-163  
flight of young, 3-409  
males eaten by females, 3-407  
prehistoric, 3-29  
protective devices, 3-411  
water spider, 3-393, †394  
king crab, 3-190, †192  
web, 3-†408-9, 411, 413  
*see also* varieties, as Jumping spider; Trap-door spider
- Spiderwort**, flower, 2-\*144
- Spike-tailed lizard**, 3-\*450
- Spikes** of grasses, 2-\*178, 179
- Spillway** of dam, 10-528
- Spinach**, vegetable, 9-150
- Spinal column**, *see* Backbone
- Spinal cord**, structure and nerves, 2-\*384, †394  
fol.
- Spinal nerves**, 2-†394 fol.
- Spindle**, thread-making, 10-339, †340
- Spindle Top oil field**, Texas, 8-383
- Spine**, *see* Backbone
- Spinel**, precious stone, color plate, 9-frontispiece
- Spines**, of plant  
modified branches, 2-33  
protection against animals, 2-†203-5
- Spinnet**, musical instrument, 12-258-l., \*221, 227, \*223
- Spinnerets** of spider, 3-406
- Spinnerette**, machine used in making rayon, 9-\*85, 86
- Spinning and weaving**, main article, 10-†338-46  
by mountaineers, 7-\*224  
earliest, 9-46  
in Highlands of Scotland, 6-\*133  
looms, 10-342, 343  
modern spinning machinery, 10-340  
thread-making, 10-339  
*see also* Weaving
- Spinning frame**, of Arkwright, 6-84
- Spinning jenny**, invention, 6-84; 10-340  
first, in Rhode Island, 8-345  
rope making, 9-\*286
- Spinning mule**, invention of, 10-341
- Spinning wheel**, 10-340, \*341, †346; 6-\*133
- Spinola, Ambrogio di**, marquis, in painting by Velasquez, 11-254
- Spinus tristis**, 8-124-A
- Spiny lobster**, 3-187
- Spiny swift**, lizard, 3-457
- Spiny-tailed lizard**, 3-450
- Spireme** of plant cell, 2-\*9, 10
- Spires**, English Gothic, 11-475, \*472; *see also* Towers
- Spirilla**, bacteria, 2-†14
- Spirit Lake**, Iowa, massacre of, 7-349; 8-193
- "Spirit of St. Louis,"** airplane, 10-\*323
- "Spirit of '76, The,"** picture, 7-\*157
- "Spiritual Exercises,"** by Ignatius de Loyola, 13-546
- Spirituals**, Negro music, 12-256, 309; 9-†28
- Spirogyra**, alga, 2-68
- Spirorbis**, worm, 3-118
- Spitteler, Adolf**, discovers casein plastic, 10-552
- Spitzbergen**, archipelago, Arctic Ocean, maps, 13-502-A; 5-573
- Spleen**, anatomy, color plate, 2-\*279
- Splice**, how to make, 14-†555
- Splint bones** of horse, 4-506, \*507
- Splinters**, how to remove, 2-405
- Split limpet**, mollusk, 3-145
- Spode, Josiah**, porcelain made by, 12-61
- Spoils system** in United States, 7-372, 224; 12-513

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Spokes**, wheel, invention of, 10-144  
**Sponge crab**, 3-180  
**Sponge fishing**, 3-\*82, \*83, †86-87  
   Bahamas, 7-†52  
**Sponges**, animals, main article, 3-†82-87  
   bacteria used in preparation of, 2-20  
   compared with bone, 2-320  
   Florida, 8-\*73  
   prehistoric, 3-9, 14, 64  
   structure and growth, 3-83  
   uses, 7-52  
   varieties, 3-84, 85, 87  
   *see also varieties, as Neptune's Cup,\*etc.*  
**Spongy mesophyll cells**, 2-†26  
**Spontaneous combustion**, 1-384, 385; 2-19  
**Spoon-billed paddlefish**, 3-\*250  
**"Spoon River Anthology,"** by Edgar Lee Masters, 13-350  
**Spoonbill**, bird, 4-†148-49  
**Spoons**, silver, 12-\*91  
**Sporades**, islands, Aegean Sea, map, 6-595  
**Sporangia** of ferns, 2-†88 fol.  
**Spores**, reproductive bodies  
   bacteria, 2-\*14, 16  
   conifers, 2-95  
   distinguished from seeds, 2-76  
   ferns, 2-†88, \*89  
   fungi, 2-71, 76  
   moss, 2-\*83, 85  
   puffball, 2-\*211  
**Sporophyll**, spore bearing leaf, 2-92  
**Sports and games**, main article, 14-†463-540  
   *(see also Contents Volume 14 and under main subjects listed below)*  
   baseball, 14-†503-8  
   basketball, 14-†481-86  
   billiards, 14-†477-82  
   boat races, 14-†530-33  
   bowls, 14-†492  
   boxing, 2-\*418  
   canoeing, 14-†509-11  
   checkers, 14-†463  
   chess, 14-†487-91  
   cricket, 2-\*360  
   curling, 1-\*316  
   fencing, 14-†512-14  
   football, 14-†515-18  
   golf, 14-†494-98  
   handball, 14-486  
   hockey, 14-†523-24  
   kite flying, 14-†499-502  
   lacrosse, 14-†493  
   major track and field sports, 14-†471-76  
   olympic games, 5-153, 154, 167; 14-†471, 475  
   pathfinding and stalking, 14-†461-68  
   polo, 14-†525-26  
   skating, 14-†519-20  
   skiing, 14-†520-22  
   snowshoeing, 14-†522-23  
   swimming, 14-†534-40  
   tennis, 14-†464-70  
   tobogganing, 14-†483  
**Sports and games—continued**  
   winter sports in Sweden, 6-†404  
   yacht racing, 14-†527-30  
   *for children's indoor and outdoor games see Things to do*  
**Sports** in plant world, 2-226  
**Spot markets**, 9-29  
**Spot-nosed monkey**, 4-\*258  
**Spotlight effect** in painting, 11-\*247, 248, †249  
**Spötrup Castle**, Denmark, 6-\*415  
**Spotted deer**, 4-412  
**Spotted hyena**, 4-308, \*309  
**Spotted sandpiper**, bird, 4-116, \*117  
**Spotted Tail**, Indian chief, 8-360  
**Spotted turtle**, 3-\*474  
**Spotted woodpecker**, 4-174  
**Spouting Horn**, New England coast, phosphorescence in waters of, 3-112  
**Spouting of whales**, 4-445  
**Sprains**, treatment for, 2-402  
**Spratling Islands**, occupied by Japan, 5-364  
**Spray nozzle**, Diesel engine, 10-\*276  
**Spraying**, plant pests and fungi destroyed by, 2-†139  
   sprayed and unsprayed plants, 2-\*137  
**Spree River**, Germany, Saxony to Havel River, 10-258; map, 6-583  
**Spreewald**, district, Prussia, people: costumes, 6-\*238  
**"Spring,"** painting by Botticelli, 11-\*145, 147  
**"Spring,"** sculpture by Maillol, 11-\*389  
**"Spring Ice,"** by Thomson, color plate, 7-\*29-I  
**Spring**, sea-on, cause and date of, 1-206, 210  
   position of sun during, 1-†111  
**Spring festivals**, ancient, 14-581  
   Roman, 12-\*326; 5-\*241  
**Spring wheat**, 9-98  
**Springbok**, gazelle, 4-418, †420  
**Springers** (voussoirs), in arch, 11-\*428  
**Springfield**, Ill.  
   Abraham Lincoln, 8-104  
   Lincoln Monument, 8-\*96  
   state capitol, 8-\*94  
**Springfield, Mass.**, 8-174  
**Springfield, Missouri**, industries, 8-212  
**Springfield, Ohio**, industries, 8-311  
**Springs**, water, underground source, 1-90, \*191  
   Arkansas, 8-26  
   hot, 1-†32-36  
   mineral, 1-36, 90  
**"Springtime,"** orchestral composition by Claude Debussy, 12-318  
**"Springtime,"** painting by Lillian Genth, 11-\*367  
**Sprinkling system** on truck farm, 9-153  
**Sprinting**, sport, 14-†72, 473  
**Spruce**, tree, 2-\*267  
   needles, 2-98  
   used in making paper, 9-277  
   used in making rayon, 9-\*84, 86  
   wood, 9-258

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Spruce Knob**, mountain, West Virginia, 8-436-A
- Spun glass**, 12-31, 34
- Spurs**, Saxon, 12-\*3
- "Spy, The,"** by James Fenimore Cooper, 13-296
- Spying tube**, 10-488
- Squab**, 9-359
- Squad**, in U. S. Army, 7-479-E
- Squakheag Indians**, in Vermont, 8-400
- Square knot**, 14-\*555
- Square measure**, 10-375
- Square-rigged boat**, 10-†171
- Square of number**, table, 10-436
- Square root of number**, table, 10-436
- Squares and square roots**, table, 10-436
- Squash**, vegetable, 9-150
- Squash**, Hubbard, 9-\*151
- Squash family**, produces largest fruits, 2-251
- Squat lobster**, crab, 3-\*174
- Squatter sovereignty**, U. S. history, 7-248
- Squatter State**, 8-132
- Squawfish**, 3-237
- Squeeze play** in baseball, 14-507
- Squids**, mollusks, 3-†169-72
- Squires**, medieval, 5-306
- Squirrel-cage induction motor**, 1-\*528
- Squirrel fish**, 3-\*114
- Squirrel monkey**, 4-265
- Squirrels**, animals, 4-†365-70, \*364  
Richardson's ground squirrel, 8-302-A  
scale drawing, 14-\*64  
*see also varieties*, as Gray squirrel; Red squirrel
- Squirrel's tail**, a sea fir, 3-105
- Squirting cucumber**, seeds ejected by, 2-\*212, 214
- St.**, abbreviation for "saint," *therefore place names preceded by*, as St. John's, city; St. John's River, *etc. are listed as though preceded by "saint"; for facts concerning the individual saints see names of saints*, as Francis; John, *etc.*
- Staaten Island**, Tasman's name for New Zealand, 5-532
- "Stabat Mater,"** sacred music  
by Anton Dvořák, 12-309  
by Palestrina, 12-260
- Stabiae**, ancient city, Italy, destruction of, 5-258
- Stable fly**, 3-360
- Stadacona**, Indian village, on site of Quebec, 13-474
- Stadiums**  
athletic, 14-\*517  
Roman, 5-\*236
- Staël-Holstein, Anne Louise Germaine Necker, Baronne de (Madame de Staël)**, life and works, main article, 13-122  
portrait, 13-\*122
- "Staff of life,"** term used for bread, 9-238
- Stafford**, or **Staffordshire**, county, England, pottery, 10-254; 12-61
- Stag**, *see* Deer
- Stag beetle**, 3-339, \*340, \*381
- Stage**  
lighting, 12-333
- Stage-** *continued*  
miracle plays, 12-327  
modern developments, 12-334  
movable; Radio City Music Hall, 12-330  
revolving, 12-334  
Roman settings, 12-325
- Stagecoach**, 10-†144 fol., †190  
mail carried by, 10-†86 fol.  
painting, "Stuck Fast," 10-\*151  
Pony Express, 10-\*87, 88, †190; 12-574
- Stagger bush**, 2-205
- Stag's-horn coral**, 3-\*99, \*100
- Stahlberg, Juho**, president of Finland, 6-457
- Stained glass windows**, main article, 12-†70-77; 11-†100-1  
how to make of cellophane, 12-73  
invention; effect on architecture, 11-462, †464  
manufacturing process, 12-\*71, †72 fol.  
medieval, 12-71, \*75  
modern, 12-\*71 fol., 77  
Renaissance, 12-\*72, \*74-75, 77  
similarity to glass mosaics, 12-112
- Stainless steel**, 9-420
- Staircase**, moving, construction and operation, 1-†337
- "Staircase" farms** of Peru, 5-\*501
- Stairways**, at Cnossus, 11-416
- Stake driver** (bittern), bird, 4-103
- Staked Plain**, U. S., 7-343-D; 8-386  
New Mexico, 8-262, 256
- Stakhanoff movement**, in Soviet industry, 6-442, 443
- Stalactites** in caves, 1-86; 7-417
- Stalagmites** in caves, 1-†86; 7-417
- Stalin, Josef Vissarionovitch (Dzhughashvili)**, life, main article, 12-†449-D-449-F  
as cabinet member, 6-439  
chief figure in Russia, 6-442, 443-B, 525  
portraits, 6-\*441, \*542, \*548; 12-\*449-E  
rôle in World War II, 6-525, 540, 546, 547, 549
- Stalingrad**, Russia, location, 10-261  
map, 6-601, G5
- Stalking and pathfinding**, main article, 14-†561-68
- "Stalky and Co.,"** by Rudyard Kipling, 13-269
- Stallings, Laurence**, "What Price Glory," 13-355
- Stalwarts**, in American politics, 7-286
- Stambul**, or **Istanbul**, Turkey, 5-404, \*405  
rainfall and temperature, 5-414-B  
*see also* Constantinople; Byzantium
- Stamens**  
conifers, 2-96  
flower, 2-†102-3
- Stamford Bridge, Battle of**, 6-14
- Stammering**, overcome by Demosthenes, 12-344, 345
- Stamp Act**, in American colonies, 7-160  
Edmund Burke's protests against, 13-201  
New York's action, 8-276  
reaction of North Carolina colonists, 8-291  
repeal of, 12-466
- Stamp Act Congress**, 7-160

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Stampede**cattle, 9-<sup>\*</sup>318, 320horses, 4-<sup>\*</sup>510**Stampfer, Simon R. von**, invents a moving-picture machine, 10-502**Stamps**

postage, 10-87, 90

revenue, 7-377; 9-224

**Standard**, tall staff once used in place of modern flags, 14-572**Standard**, petal of pea flower, 2-166**Standard of living**changed by Industrial Revolution, 6-<sup>84</sup>

China and Japan, 7-462

Middle Ages, 5-301-6

**Standard Oil Company**, 12-583; 7-282**Standardization**, 7-566**Standards, National Bureau of**, 7-380**Standish, Miles**, leads Pilgrims, 7-<sup>\*</sup>145**Standpipe**, for water supply, 10-538**Stands**, furniture, 12-<sup>\*</sup>183, <sup>\*</sup>191, <sup>\*</sup>194**Stanford, Leland**, 10-503**Stanislas II**, king of Poland, 6-451, 452**Stanislavsky, Constantin Sergeyevich**, theater founded, 12-333**Stanley, Sir Henry Morton** (John Rowlands),

African explorer, 5-462, 468

finds Livingstone, 13-554

**Stanley, Mount**, Africa, height, 5-473-A**Stanley Cup**, trophy for ice hockey, 14-524**Stanley Ranger Station**, Utah, 2-<sup>\*</sup>247**Stanton, E. M.**, statesman of U. S., 12-456-D**Stanton, Edwin McMasters**, discharge, 7-271**Stanton, Elizabeth Cady**

fights for women's suffrage, 12-572

founds women's temperance society, 12-572

**Staphylococcus**, family of germs, 9-219-B**Staple cotton**, 9-32**Star**, as emblem, Minnesota, 8-189**Star**, astronomy, *see* Stars**Star and crescent**, in Turkish flag, 14-572, following <sup>\*</sup>572**Star Chamber**, developed by Henry VII, 6-42**Star clock**, 1-186**Star coral**, 3-<sup>\*</sup>98, 100, <sup>\*</sup>101**Star drift**, 1-171**Star dust**

in comet's tail, 1-162

Saturn's rings composed of, 1-156

**Star maps**, 1-178-A-178-L

northern sky

January and February, 1-178-A

July and August, 1-178-G

March and April, 1-178-C

May and June, 1-178-E

November and December, 1-178-K

September and October, 1-178-I

southern sky

January and February, 1-178-B

July and August, 1-178-H

March and April, 1-178-D

May and June, 1-178-F

**Star maps**, southern sky—*continued*

November and December, 1-178-L

September and October, 1-178-J

**Star-nosed mole**, 4-278**Star-of-Bethlehem**, flower, 2-<sup>\*</sup>148**"Star Silver,"** fairy tale, text, 14-204**"Star-Spangled Banner,"** writing of, 14-573**Star tears** (star water), name for dew, 1-240**Star time**, 1-186**Starboard**, of a boat, 14-532**Starch**, chemical elements in 2-40

changed to sugar by digestive juices, 2-356

from potatoes, 9-144

in corn, 10-547

in seeds of cereals and grasses, 2-129

stored and changed into sugar by plants, 2-53, 236, 237

**Starfish**, 3-†128-35, <sup>\*</sup>139

behavior, 3-131, 135

first appearance on earth, 3-64

Ordovician period, 3-13, 15

oysters destroyed by, 3-132

prehistoric, 3-9, 18, 30

sea urchins compared with, 3-136

**Starling**, bird, 4-225, color plate, <sup>\*</sup>25

varieties, 3-133

**Stark, John**, victory at Bennington, 12-†488-89**Starlets**, minor planets, 1-6color plate, 4-<sup>\*</sup>40**Starr, Ellen**, friend of Jane Addams, 12-581**Starred tortoise**, 3-472**Stars**, main article, 1-†169-80

age determined by color, 1-173

brightest, 1-170

classification, 1-170

clocks regulated by, 1-186

composition, 1-170, 171

determined by spectroscope, 1-†187, 440, 441

constellations, 1-177

maps, color plates, 1-178-A-178-L

on Zodiac, 1-<sup>\*</sup>170*see also* Constellations

determining parallax of, 1-†172-73

difference between planets and stars, 1-105, 175

distance from earth, 1-172

double (binary) stars, 1-174

Einstein predicts bend, 13-409

falling stars, 1-†164

"fixed," 1-174

Galaxy, 1-175

heat, 1-173

Herschels' discoveries and maps 13-404-5

life history, 1-173, 559

light, 1-170

attracted by sun, 1-†427; 13-409

motor run by, 2-<sup>\*</sup>414

magnitudes, 1-170

maps, color plates, 1-178-A-178-L

morning and evening, 1-146

movement: rate of speed, 1-†114, †171

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Stars—continued**

- names, 1-177
- number of, 1-171
- part played in astrology, 1-100
- planetary nebulae, 1-183
- Pole Star, 1-178
- Sirius, time kept by, 10-480
- size, 1-170
- speed through space, 1-172
- temporary, 1-174
- tramp star, 1-†7
- transits, 1-186
- twinkling of, 1-†174, 175
- Tycho Brahe's studies, 13-394
- variables, 1-174; 13-404
- why invisible in daylight, 1-†175, \*176, 426
- why they appear to rise and set, 1-†186
- see also* Constellations; Planets

**Stars and Stripes**, name for flag of United States, 14-†573, †574

- color plate, 14-following 570, no. 68
- first used, 7-162

**"Starving time"** in American colonies, 7-122**State, Department of**, United States, 7-373**State birds**, *see subhead* state bird listed under individual states**State flags**, *see subhead* flag under names of individual states**State flowers**, *see subhead* state flower under individual states**State government**, *see* States**State histories**, *see* Contents Volume 8**State House**, Boston, 8-†165

- codfish in, 8-169

**State House**, Old, Boston, 7-†364**State institutions**, *see subhead* charities and correction under individual states**State Junior College for Colored Students**, at Dover, Del., 8-66-A**State medicine**, Saskatchewan, 7-29-U**State monuments**, *see subhead* monuments under names of individual states**State mottoes**, *see subhead* motto listed under individual states**State of Camden and Amboy**, nickname for New Jersey, 8-252-A**State of Franklin**, early name for Tennessee, 8-374**"State of Maine Song,"** by Roger Vinton Snow, 8-156-A**State officials**, *see subhead* political facts listed under various states**State parks**, *see subhead* parks under individual states**State reservations**, *see subhead* reservations, game and bird listed under individual states; and also Indian reservations**State socialism**, *see* Socialism**State songs**, *see subhead* state song under individual states**"State Sovereignty-National Unity,"** motto, 8-106-A**State universities**, earliest, 7-243; *see also subhead* education under individual states**Staten Island**, N. Y., 8-283**Staterooms**, steamer, 10-†295**States****Europe**, smallest in, 6-†466-69**United States**,

- Constitutional restrictions, 7-186
- first written state constitution, 8-62
- formation and admission to Union, 7-176
- free-soil or slave-state controversy, 7-218, 236, 247
- interdependence of trade, 7-568-170, \*572, 575
- largest, 8-386
- liquor control, 7-336
- list, 7-343-F
- politics and government, 7-†383-89
  - constitution and government, 7-384
  - lawmaking bodies, 7-385
  - laws, 7-385, 386-88
  - Nebraska, 8-227
  - political subdivisions, 7-386
  - private and public wrongs, 7-387
  - representation in Congress, 7-363
  - roadways, 7-389
  - Wisconsin, 8-445
- see also subhead* political facts under various states

**state histories**, *see* Contents Volume 8  
*also names of various states***state maps**, *see* Contents Volume 8**States of the Church**, *see* Papal States**States' rights**

- and nullification, controversies over, 7-224
- Calhoun champions cause of, 12 522
- guarded by Constitution, 7-383
- Webster's position on question of, 12 524

**States' Rights Party**, 7-343-B**Static electricity machine**, 1-†494, 495, \*496**Statue of Liberty**, New York, 7-†402; 8-284-A**Statues**

- cast in metal, 12-†18 fol., 3
- decorated with enamel, 12-64
- of glass, 12-28
- prohibited in Greek churches, 5-407
- size, 12-96
- terra cotta, 5-†190
- see also* Sculpture

**Statues, living**, game, 14-169**Statuettes**

- Byzantine, 12-†90
- Cretan snake goddess, 11-†34
- Egyptian, 11-†15; 12-†99
- pottery, 12-53

**Statute law**, 7-387**Statute of Westminster**, 7-29-A**Stave church**, Oslo, Norway, 11-†462**Stavisky scandal**, in France, 6-202**Stayz**, of a square-rigged vessel, 10-171**Staysails**, 10-†171**Steam**, heat changes water into, 1-404  
changes readily into a liquid, 1-406

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Steam—continued**

- clouds of, over cooling earth, 1-11
- how it works, 10-395
- source of power; economic importance, 7-499
- used as refrigerant, 1-408, 409

**Steam engine**, main article, 10-†395-401

- boiler, 10-†397
- chemical control, 10-549
- condenser, 10-401
- earliest, 10-†396-98
- governor regulates speed, 10-†401
- horse power, 10-397
- James Watt and his invention, 10-†398-401
- locomotive, 10-†175-83; *see also* Locomotives
- turbines, 1-506, 507, 508; 10-401
- Watt, 10-†399-401, 176
- working of modern, 10-†397

**Steam geyser**, 1-\*.344**Steam heating**, 1-\*.479, †480; 10-†382 fol.

- steam condensation heats radiators, 1-406

**Steam power**, 7-499

- electric power derived from, 10-549

**Steam turbines**, use in power stations, 1-506, 507, 508**Steam vehicles**, earliest, main article, 10-†175-83, 277, 280**Steamboat Case**, 12-456-D**Steamboat model**, how to make, 14-†34**Steamboats and steamships**, main articles, 10-†216-24, †293-304

- cargoes, 7-573; loading, 10-248-49
- Detroit's earliest, 8-182
- Diesel engine used, 10-276
- earliest reported steamboat, 10-396
- early paddle boats, 10-218, \*219, 220
- first to cross Atlantic, 10-†221
- first trip on Missouri, 8-360
- Fulton's first boat, 10-217, †218, 221
- icing plants, 10-518
- imitation steamship for motion picture, 10-\*.509
- international trade stimulated by, 7-573
- life on board a steamer, 10-\*.295, \*301
- amusements, 10-\*.298, \*300, 302, \*303
- baths, 10-297, 302, \*303
- dining service, 10-296, \*301, 302
- staterooms, 10-†295-96
- machinery, 10-\*.299, 300
- mail service, 7-378
- Mississippi River boats, 7-214, \*218, \*247
- modern steamboats, 10-\*.217, \*219, †223
- navigation of steamship, 10-\*.299, 300, 304
- "Normandie," 7-\*.570
- "Queen Elizabeth," 10-\*.295

**Stearns, J. B.**, 10-99**Steel**, manufacture of, 9-401, †403-8, \*406-7

- Bessemer process, 9-403; 6-368
- converter for, 9-\*.403
- diving suits made of, 10-524
- hardened with nickel, 9-420
- inspection by chemist, 10-548
- magnetism, 1-486, 487

**Steel—continued**

- melting point, 1-\*.392
- manufacture and industry
  - Alabama, 8-\*.6
  - Illinois, 8-103
  - Indiana, 8-114
- open-hearth process, 9-†405
- process of making, 9-401
- rails made of, 9-\*.406-7; 10-194
- stainless, 9-420
- travel of sound through, 1-†445, 446
- tungsten, 9-422; 1-536
- uses, 12-10
  - ancient times, 12-3
  - bridges, 10-214
  - building, 11-516; 9-380
  - fire making, 10-†332
  - shipbuilding, 7-483; 10-360
  - weapons, 10-354 and fol.

**Steel Age**, 12-10**Steel engraving**, 10-62**Steel State**, nickname for Pennsylvania, 8-342**Steele, Sir Richard, life and works**, main article, 13-†180-82

- method of transporting fish, 10-514
- portrait, 13-\*.180

**Steelyard**, scale, 10-\*.370, \*374, \*375**Steen, Jan**, paintings, 11-†266**Steens Mountains**, Oregon, 8-331**Steeplechase races**, 14-472, 474**Steering paddles** of sail ships, 10-162**Steers, George**, builds yacht "America," 14-528**Steffens, Lincoln**, 7-308**Stegen, Johanna**, heroism in battle, 6-\*.225**Stegocephalians**, prehistoric animals

- Carboniferous period, 3-29
- Permian period, 3-33

**Stegosaurians**, prehistoric animals, 3-†42**Stein, Gertrude**, author, 14-351**Steinheil, Karl August**, 10-96**Steinmetz, Charles Proteus**, portrait, 1-\*.524**Stel, Simon van der**, governor in Africa, 5-477**Stele (pillar)**, of Naram-Sin, 11-\*.22, 25**"Stella," friend of Swift**, 13-178, †179**Stellenbosch Fair**, 5-477**Steller's sea cow**, whale, 4-441**Stem turn**, skiing, 14-522**Stems, structure and functions**, main article, 2-†28-33, \*48

- bamboo, 2-\*.179

## cells of flax stem, 2-\*.8

## cross section, 10-\*.487

## corn stalk, 2-\*.31

## Sequoia, 2-\*.28

## sugar cane, 2-\*.32

## timothy grass, showing vascular bundles, 2-\*.144

## dicotyledons, diagram, 2-†33

## flow of sap, 2-9, 235 fol.

## grasses, 2-178, \*179

## herbaceous, 2-†31

## monocotyledons, 2-†144, 178

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Stems—continued**

- underground, 2-32
- woody plants, 2-†28-31
- Stencil**, how to make, 14-†9
- Stenkil**, king of Sweden, 6-394
- Step-down transformer**, 1-†510
- Step-up transformer**, 1-†510
- Stephans, Evans**, song by, 8-396-A
- Stephen, Saint**, king of Hungary, reign, 6-278  
monument at Budapest, 6-†283
- Stephen**, king of England, 6-20
- Stephen Báthory**, king of Poland, 6-450
- Stephen, George**, builds railroad, 13-565-66
- Stephenson, George**, locomotives of, 10-179,  
\*180, †181, \*186  
boyhood, 10-179  
building of first railway by, 10-†185-87  
drives locomotive over first railway, 10-181  
portrait, 10-†181  
prophecy about railways, 10-188  
safety lamp invented by, 13-384
- Stephenson, Robert**, 10-181
- Steppes**, Russia, 6-443-A, 162-C
- Stereonithes**, prehistoric birds, 3-56
- Stereotype**, printing plate, how made, 10-81
- Sterilization**, food preservation by, 9-226, 338  
canning, 9-231  
importance to medicine, 10-549
- Sterling silver**, 9-390
- Sterne, Laurence**, life and works, main article,  
13-†189-90  
portrait bust, 13-†189  
"Sentimental Journey," 6-303
- Stethoscope**, heart beat detected with aid of,  
2-372
- Stettin**, Germany, 10-258  
map, 6-583, F2
- Steuben, Frederick William, Baron von**, life and  
service in America, 12-453, †454, 456  
portrait, 12-†453
- Steubenville**, Ohio  
iron manufacture, 8-311  
wool industry, 8-310
- Stevedore**, 10-249
- Stevedore knot**, 14-†555
- Stevens, A. W.**, ascent into stratosphere, 1-  
\*372; 10-314
- Stevens Institute of Technology**, 8-251
- Stevenson, Adlai E.**, vice president of the United  
States, 12-456-G
- Stevenson, Robert Louis**, life and works, main  
article, 13-265; 2-414
- Stewardson, Edward**, statue by, 11-†373
- Stewart**, *see also* Stuart
- Stewart, John**, Canadian fur trader, 13-564
- Stewart Island**, New Zealand, 5-541-B  
map, 5-599
- Stick, composing**, 10-†60
- Stick insects**, 3-351, †352-54
- Sticklebacks**, fishes  
care of eggs and young, 3-†210, 211, 230

**Sticklebacks—continued**

- fresh-water, 3-†229
- salt water, 3-†210
- Stiegel, William Henry**, colonial glass made by  
12-36, \*37
- Stigma**, organ in flowers and its function, 2-  
†102-3, \*172; in corn 2-113
- Stikine River**, North America, 8-16
- Still**, for extracting rose oil, 9-†300
- Still life painting**, 11-284  
Cézanne's paintings, 11-383, \*384  
Chardin's paintings, 11-284
- Stilt**, bird, 4-†117
- Stilt palm**, prop roots, 2-38
- Stilton cheese**, 9-347, 348
- Stilts**, how to make, 14-†42
- Stilus**, *see* Stylus
- Stimson, Henry Lewis**, his efforts toward  
peace, 7-338
- Sting**, of bee, 10-†489; 3-314
- Sting cells** of hydroid, 3-110
- Sting ray**, fish, 3-201
- Stinging thread**, a variety of sea anemone, 3-90,  
91
- Stinkhorn**, fungus, 2-†74, \*75
- Stippling**, on stained glass, 12-76
- Stipules**, of plant, 2-23, 24, 133  
modified into thorns, 2-†205
- Stirling, James**, portrait, 5-†554
- Stirling Bridge, Battle of**, in Scottish history,  
6-†113; 12-381, 382
- Stirrup (stapes)**, ear bone, 2-†303
- Stitchdown process**, as employed in shoe manu-  
facture, 9-61, \*62
- Stitches**  
basketry, 12-135  
crocheting, 14-†80  
embroidering, 14-†74  
knitting, 14-†81  
lace, *see* Lace and lace making  
sewing, 14-†72
- Stoats**, animals, 4-†355, 356
- Stock raising**, 9-†317-29
- Stock**, its purpose and employment in the process  
of grating, 2-231
- Stock**, of corporations, 7-525
- Stock tickers**,  
invented by Edison, 13-443
- Stockades**, built for protection against Indians,  
7-†129
- Stockholders**, 7-580
- Stockholm, Sweden**  
attacked by Swedes, 6-†412  
location by Lat. and Long., 6-407-A  
longest day, 1-202  
map, 6-597, F7  
rainfall and temperature, 6-407-A  
Södermalm district, 6-400  
waterway linking the city to Gothenburg, 10-259
- Stockholm Massacre**, event in Swedish history,  
6-397, 398

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Stockton, Robert Field**, 7-238  
**Stockton and Darlington railway line**, 10-179  
**Stockton Plateau, Texas**, 8-386  
**Stockyards, Chicago**, 9-327, 329  
**Stoffels, Hendrikje**, 11-277  
**Stoics, philosophy of**, 13-11, 57  
**Stoke Poges, England**, 13-\*20<sub>2</sub>, 203, 204  
     church, 11-\*476  
**Stokowski, Leopold**, orchestra leader, 10-\*499  
**Stola, Roman garment**, 9-\*7  
**Stolzenfels, castle, Germany**, 11-\*488  
**Stoma, of leaf**, 2-†26, \*42, \*48, 51, \*52  
**Stomach**, 2-\*335, \*352  
     digestive process, 2-354, \*356  
     lining, 2-\*356  
**Stomata, see Stoma**  
**Stone, Harlan, chief justice**, 6-\*548  
**Stone**  
     early carvings left on, 6-†374  
     fossils, how found in, 3-5  
     glacial scratches in, 1-60  
     lack of, in Mesopotamia, 11-24, 26  
     sacred, of Islam, 5-421, 422  
     uses  
         architectural, in Egypt, 11-409  
         building, 9-375, 379  
         by ancient sculptors, 11-19, 25  
         Gothic statues, 11-98  
     worn into pebbles, 1-49  
     *see also* Rocks  
**Stone, measure of weight**, 10-375  
**Stone Age, civilization, main article**, 5-†23-40;  
     11-2-3  
     agriculture, 5-\*32; 7-450  
     art, in **Old Stone Age**, 11-†1-4; 5-\*6, 7  
         carvings, 12-95, \*106  
         pottery, 12-47  
     bread making, 9-238  
     clothing, 5-28, 30  
     coal used, 9-435  
     fire making, 10-\*333  
     horse and its use, 4-510  
     lake dwellers, 6-244  
     Malta, 6-†475  
     New Stone Age or Neolithic Period, 5-34-40  
     Old Stone Age, 5-23-33  
         earlier or Lower Paleolithic Period, 5-23-27  
         later or Upper Paleolithic Period, 5-27-33  
     reason for name, 9-399  
     Scandinavia, 6-371  
     Spain, 6-317  
     tools and weapons, 5-24 fol.; 11-\*2-3  
     *see also* Man, prehistoric  
**Stone carving**, 9-380  
     American; Mount Rushmore Memorial, 8-\*361  
     Assyrian, 11-\*26, \*27; 12-\*106  
     Babylonian, 11-\*22  
     Burgundian, 11-\*103  
     Byzantine, 11-\*76, \*77; 12-\*94  
     Egyptian, 11-\*17, \*19; 12-\*94, 102  
     French, 11-\*86-87, \*89, \*93, \*95, \*97  
     Gothic, 11-\*95, 96, †97  
     **Stone carving--continued**  
         Greek, 11-†40-42, \*44, \*52, \*54, \*422, \*425;  
             5-\*16; 12-\*94  
         Indian (East), 12-102; 5-\*380  
         Italian, 11-†107-9, \*124, †125, †130, \*131, \*132,  
             \*137; 12-\*94  
         Mayan, 7-†90  
         memorial carved on Mount Rushmore, 8-361  
         Mycenaeac, 5-\*20  
         prehistoric, 5-\*6, 7, \*31; 12-95, \*106  
         Roman, 5-\*4; 11-\*66, \*67-68; 12-\*94, \*104  
         Romanesque, 11-†86-89  
         Scandinavian, 6-\*374  
         *see also* Carving; Sculpture  
     **Stone curlews** (ibises), birds, 4-148  
     **Stone fence, New England**, 8-\*168  
     **Stone flies**, 3-387, †388  
     **Stone fruits**, 2-120, †121  
     **Stone images on Easter Island**, 5-\*520, 521, 529  
     **Stone industry, see Quarries and quarrying**  
     **Stone Mountain, Georgia**, 8-84  
     **Stone of Scone in Coronation Chair**, 12-†182  
     **Stone pines, seeds**, 2-97  
     **Stone plovers, birds**, 4-\*115  
     **Stonecutting**, 9-379  
     **Stonehenge, England, Druid temple**, 6-\*1, \*8;  
         10-\*483  
     **Stones**  
         used for spreading alarm, 10-30  
         *see also* Gems; Rocks  
     **Stone's River National Military Park, Tenn.**,  
         8-374  
     **Stonework, Mayan**, 7-90  
     **Stony coral**, 3-100  
     **Stony crab**, 3-183  
     **Stony Point, Battle of**, 12-†491  
     **Stool ball, game**, 14-171  
     **Stools, furniture**, 12-†175 fol  
     **Stopher, Vashti Robertson, song by**, 8-146-A  
     **"Stopping by Woods on a Snowy Evening,"**  
         poem by Frost, 13-349  
     **Stopping distances, for safety in driving, table**,  
         2-437  
     **Stops, of organ**, 12-258-10  
     **Storage battery, construction**, 1-\*498  
         pressure, 1-510  
     **Store, game**, 14-162  
     **Storehouse, on stilts**, 6-\*403  
     **Storekeeper, game**, 14-162  
     **Storer, C. A.**, 14-477  
     **Stores, types of**, 7-†538  
     **Stories, see Contents Volume 14 and also Fables;**  
         Fairy tales; Mythology; Novels  
     **Storks, birds**, 4-\*193, \*195, †196-97  
         color plate, 4-\*184  
         nest building and breeding, 4-197  
         shoe-billed, 4-\*11  
     **"Storm, The," painting by P. A. Cat.** 11-\*333  
     **Storm cloud (nimbus)**, 1-236, \*239  
         seeding of in rainmaking, 1-\*249  
     **Storm petrel, bird**, 4-217  
     **Stormberg, Battle of**, 5-488

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Storms**

- blizzard, 1-252
- clouds, 1-235-37, \*239, \*245, \*247, \*249
- forecasting, 1-277-78
  - familiar signs, 1-264-67
- hail, 1-249
- ice, 1-251, \*267
- magnetic, 1-489
- seeding clouds to prevent, 1-\*249
- sleet, 1-249, 251
- thunder and lightning, 1-246-48
- wind, 1-228 fol., 277

**Storms, Cape of**, *see* Good Hope, Cape of  
**Storthing**, or **Storting**, Norwegian parliament, 6-407-A, 390

**"Story of My Life, The,"** by Helen Keller, 12-568

**"Story of Prince Ahmed,"** text, 14-†251-53

**"Story of the King, The,"** tapestries, 12-144

**"Story of the Three Kingdoms, The,"** Chinese novel, 5-321

**Story-telling in art**, Ruskin-Whistler controversy about, 11-320

**"Stourbridge Lion,"** locomotive, 10-183

**Stover, Ida Elizabeth**, *see* Mrs. David Jacob Eisenhower

**Stoves**

- earliest, 10-381
- Franklin, 12-465
- home baking developed by invention, 9-241
- pottery stoves, 12-\*58

**Stowe, Calvin Ellis**, 13-318, 319

**Stowe, Harriet Beecher**, life and works, main article, 13-†317-19

portrait, 13-\*319

**Strabo**, Greek geographer, 5-229

**Stradivari, Antonio**, violins of, 12-†224, 258

**Strafford, Thomas Wentworth**, earl of

raises money for Charles I, 6-63

trial and execution, 6-\*62, †63

viceroy of Ireland, 6-154

**Straight laces**, 12-\*165, 170

**Strains**, treatment for, 2-402

**Straits Settlements**, Malay Peninsula, 5-426, 430-A, 430-B

map, 5-588

**Strand**, in rope making, 9-\*286, 288

**Strand wolf**, 4-309

**Strang, William**, 10-65

**"Strange Interlude,"** drama by O'Neill, 13-354

**Strasbourg**, France, 10-256

clock, 10-468

**Strasbourg Cathedral**, 11-\*461

**Strassburg, Gottfried von**, *see* Gottfried von Strassburg

**Strata**, layers of rock, 3-2; 1-\*40

color plate, 3-frontispiece

**Stratford on Avon**, England

Anne Hathaway's cottage, 12-\*186; 13-\*155

birthplace of Shakespeare, 13-\*154

grammar school, 13-\*156

Shakespeare memorial, 13-\*156

today and in Shakespeare's time, 13-†153

**Strathcona, Donald Alexander Smith**, baron, biography, 13-†564-66; 7-†25

**Stratification of seeds**, 2-217

**Strato-cumulus clouds**, 1-\*247

**Stratosphere**, 1-218, \*454, 372

**Stratovision**, 10-\*126-A

**Stratton, Charles**, *see* "Thumb, Gen. Tom"

**Stratus clouds**, 1-236, \*247

**Strauss, Richard**, life and works, 12-315-16

in Vienna, 6-273

music of, 12-252

portrait, 12-\*315

saxophone, wrote for, 12-258-E

**"Stratoliners,"** 10-325

**Stravinsky, Igor**, 12-255

**Straw**, 9-101

hats made of, 9-†90

uses, 2-180

brick making, 9-376

**Strawberries**, 9-†156-57

Florida's crops, 9-\*226

water content, 2-259

**Strawberry Banke**, New Hampshire colony, 8-237

**Strawberry Hill**, Walpole's castle, 13-203

**Strawberry Valley Bird Refuge**, 8-396-A

**Streamlining**

airplanes, 10-\*315, 328-O-28-1†

automobiles, 10-\*277

locomotives, 10-\*175

trains, 10-\*185

**Stream of consciousness in writing**, 13-351

**Streams, formation**, main article, 1-†46-49

animal life in, 3-†222-24; *see also* Fresh water, animal life in

expose strata by cutting, 3-†1

land worn away by, 1-21; 3-62

potholes made by, 1-\*62

salt in, 1-44

source of power for mills, 9-\*233, 234

valleys formed by, 3-3

*see also* Rivers

**Street car lines**, 7-399; 2 431

**"Street Scene,"** drama by Elmer Rice, 13-355

**"Street Scene, Quebec,"** painting by Gagnon, color plate, 7-\*29-I

**Streets**

cleaning, 7-†400

lighting, 7-397

arc light, 10-392

early methods, 10-390

sodium vapor lamps, 10-549

paving, 7-395

pipes and cables under, 7-†397-400

widening difficult, 7-447

**Streptomycin**, drug, 9-219-B

**Stretcher**, improvised, 2-†400

**Striated (striped) muscles**, 2-327, \*330

**Strikes**, 7-\*540, 541, \*560, \*562, 563

1877, 7-283

after World War I, 7-333

coal strike 1902, 7-309

during Cleveland's administration, 12-456-B

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Strikes—continued**

- England, 6-102, 108  
 Michigan, 8-186  
 Pullman strike, 7-290  
 "sit-down," 7-\*561, 563  
 West Virginia mining, 8-436  
 "Striking circle," in game of hockey, 14-523  
 Strindberg, August, 6-407  
 String, 9-288  
 String bean, vegetable, 9-150, \*151  
 String quartet, 12-233  
 String-telephone, 1-†447  
 Stringed instruments, 12-258  
   early, 12-202  
   pitch variation, 1-449  
   *see also names of stringed instruments,* 'as Piano; Violin  
 Stringfellow, J., airplane, 10-\*316  
 Strings, music, of violin, 12-258  
 Strip cropping, 7-468  
 Striped bass, 3-\*239  
 Striped chipmunk, 4-370  
 Striped gopher, animal, 4-370, \*372  
 Striped hyena, 4-309  
 Striped snake, 3-498  
 Stroboglow, scientific instrument, 1-\*416  
 Strokes, of automobile, 10-†282  
 Strokes, swimming, 14-†535, †536, 540  
   back stroke, 14-†536  
   breast stroke, 14-†536  
   crawl, 14-†535  
   side stroke, 14-†536  
 Strokes, tennis, 14-†468-69  
 Stromboli, Mount, volcanic peak, 6-162-C  
 Stromness, Orkney Islands, ancient cottages, 6-134  
 Strong boxes, iron, 12-†4  
 Strongbow, Richard, *see* Clare, Richard de, Earl of Pembroke  
 Strontium, element, symbol, atomic no. and wt., 1-\*551  
 Strophades, islands, Greece, 14-420  
 Strozzi Palace, Florence, 11-\*483  
 Struensee, Johann Friedrich von, count, in control of Danish government, 6-415  
 "Struggle of the Two Natures in Man," sculpture by George Grey Barnard, 11-\*374  
 Struma, river of Southwestern Bulgaria and Greece, map, 6-594  
 Strychnine, drug, source; uses, 9-219  
 Strychnos, plant group, poison from, 9-219  
 Stuart, Charles (the Young Pretender), *see* Charles Edward Stuart  
 Stuart, Charles, explorations in Australia, 5-550, 552-53  
 Stuart, Gilbert  
   helped by Benjamin West, 11-354  
   portraits by  
     John Adams, 12-\*480  
     Major and Mrs. John Biddle, 11-\*370  
     Washington, 11-\*355, 356; 12-\*474  
     Sarah Goodridge's portrait of, 11-\*355

- Stuart, James, second earl of Murray, *see* Murray, James Stuart, second earl of  
 Stuart, James, and Revett, "The Antiquities of Athens," 5-18; 11-288  
 Stuart, James E. B., portrait, 7-\*257  
 Stuart, James Francis Edward (the Old Pretender), *see* James Francis Edward Stuart  
 Stuart, house of, rule in England, 5-†59-72  
 Stuart kings, *see* Charles I and II and James I and II of England and James I-VI and Robert II and III of Scotland  
 Stubtoe State, 8-220-A  
 Stucco, plaster, 9-384  
 "Stuck Fast," picture, 10-\*151  
 Studding sails, 10-\*171  
 Studio, Radio, 10-121-A-21-G  
 "Study of a Young Girl's Head," 11-\*285  
 Stump Lake Bird Refuge, North Dakota, 8-302-A  
 Stump-tailed skink, lizard, 3-\*460  
 Sture family of Sweden, imprisonment, 6-399  
 Sture, Nils, death, 6-\*399  
 Sture, Sten, the Elder  
   and Queen Christina of Denmark, 6-\*412  
   made ruler of Sweden, 6-397  
 Sture, Sten, the Younger  
   death, 6-\*396  
   leads rebellion against Denmark, 6-397, 413  
 Sturgeon, fish, 3-244, †245  
 "Sturm und Drang," age of, in German literature, 13-282  
 Stuttering, overcome by Demosthenes, 12-344, 345  
 Stuyvesant, Peter, 8-272  
   captures Delaware settlement, 7-\*128  
   on Bowling Green, 14-†492  
   pictured with William Kuf, 8-\*266  
   refuses to surrender New Amsterdam, 7-130, \*132  
 Style, of flower, 2-†102-3, \*172  
 Styles, *see* Costume  
 Stylus, writing implement, 5-87; 10-44  
 Stymphalian birds, in mythology, 14-428  
 Styrene, 9-271, 271-B  
 Styria, prov., Austria, 6-259  
 Styx, mythological river, 14-407  
 Subcutaneous layer of skin, 2-287, \*288 †290  
 Sub-marginal lands, 7-466  
 Submarine cables, *see* Cables, submarine  
 Submarines, boats, main article, 10-†306-10; 7-485  
   Diesel engine used in World War I, 10-276  
   F 4 of United States, raised by divers, 10-526  
   how built and operated, 10-\*306, †309  
   in warfare, 10-362  
   periscope, 10-\*306, \*308  
   plans for, drawn by Leonardo da Vinci, 11-151  
   Portsmouth's building yards, 8-238  
   sinking and rising explained, 1-471, †472  
   use in World War I, 7-320, 326  
 Submersible decompression chamber, for diver, 10-\*522, \*524

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Subsoil**, in earth's crust, 1-40; 7-466  
**Subspecies**, 4-\*135  
**Substantia eburnea** (dentine) of tooth, 2-\*313  
**Subtraction**  
 algebra, 10-434-35  
 arithmetic, 10-429  
**Subtrahend**, mathematics, 10-435  
**Subtreasury Building**, New York, site of Washington's inauguration, 7-\*198  
**Subway system**, 7-399; 10-\*198  
 air brakes, 1-†461, 462  
 earliest, 7-304  
 voltage used to operate, 1-510  
**Succession, Wars of the**, *see* Austrian Succession, War of the; Spanish Succession, War of the  
**Suchow**, China, Great Pagoda, 11-\*394  
**Sucker**, variety of fish, 8-106-A  
**Sucker-clad arms** of mollusks, 3-167, †168, 170  
**Sucker State**, 8-106-A  
**Suckers**, nickname for people of Illinois, 8-106-A  
**Sucking thumb and fingers**, effect upon teeth, 2-311, 312  
**Suckow**, Ruth, author, 13-352  
**Sucre, Antonio José de**, South American patriot, 5-505, 512, 516  
**Suction pump**, in heating system, 1-480  
**Suction stroke**, of automobile, 10-†282  
**Sudan**, region, Africa, races in, 5-445  
**Sudan, Anglo-Egyptian**, Africa, 5-455  
 maps, 5-579, 575, 576  
**Sudan, French**, colony, Africa, 5-473  
**Sudanic tongues**, 5-473-B  
**Sudd**, floating vegetation, 2-264  
**Sudeten Germans**, in Czechoslovakia, 6-241  
**Sudras**, caste in India, 5-368  
**Suevi**, Germanic tribe, 5-268  
**Suez, Gulf of**, Egypt, map, 5-578  
**Suez, Isthmus of**, 5-473-A  
 sea routes blocked by, 10-167  
**Suez Canal**, Egypt, 10-270, 274  
 Disraeli secures control of, 12-441  
 location; use and government of, 10-†166  
 maps, 5-578, 575  
**Suez route**, 10-236-37  
**Suffocation**, danger of, from plants, 2-50  
**Suffolk**, Va.  
 consolidated with other ports, 8-415  
 industries, 8-415  
**Suffrage**  
 Athens, 7-348; *see also* Ostracism  
 Austria, 6-273  
 Brazil, 5-512  
 Chile, 5-518-H  
 Colombia, 5-518-E  
 Costa Rica, 7-48-B  
 Finland, 6-457  
 France, 6-202-B  
 grandfather clause of southern states, 8-8  
 Guatemala, 7-48-A  
 Hungary, 6-290-B  
 in the thirteen original states, 7-178, 194  
 Indians; North Dakota, 8-302-A  
**Suffrage—continued**  
 Japan, 5-363  
 Lithuania, 6-464-B  
 Massachusetts Bay Colony, 8-167  
 Mexico, 7-84  
 Nicaragua, 7-48-B  
 Norway, 6-390  
 Paraguay, 5-518-G  
 Peru, 5-518-D  
 Porto Rico, 7-60  
 Portugal, 6-342  
 religious and property qualifications dropped, 7-222  
 Russia, 6-443-B  
 Siam, 5-430-A  
 Turkey, 5-414-B  
 United States, 7-354  
 Constitution concerning, 7-190  
 absentees voting law, New York State, 8-284-A  
 Reconstruction Period, 8-143  
*for state regulations see subhead* political facts  
*listed under names of various states*  
 Uruguay, 5-518-G  
 Yugoslavia, 6-290-B  
*see also* Woman suffrage  
**Suffragettes**, militant, in England, 6-103  
**Sugar**  
 a luxury in past times, 9-113  
**beet sugar**, 9-126-27  
 producing regions, 9-126  
 by-products; bagasse, 9-293, \*294  
**cane sugar**, 9-†113-16  
 cross section of stalk, 2-\*32  
 Cuba's production, 7-56  
 producing regions, 9-116  
 Hawaii, 8-460  
 Louisiana's production, 8-143, \*144  
 chemical elements, 2-40  
 how plants make and use, 2-41 fol., 236, 237  
**maple sugar**, 9-†122-24  
 raw, 9-127  
 refining, 9-114 fol.  
 storage in human body, 2-361, 362  
 use, by cells, 2-362  
 world production of, 9-116  
**Sugar apple**, 9-196  
**Sugar beet**, 9-†126-27  
 Colorado, 8-†51  
 Utah, 8-\*391  
**Sugar bowl**, silver, 12-\*91  
**Sugar cane**, description, 9-114 fol.  
 harvesting, 9-\*113  
 planting, 9-\*113  
 United States, 7-343-E  
**Sugar castor**, silver, 12-\*91  
**Sugar maple**, tree, how sugar is made by, 2-†235-38, \*275  
 leaf, 2-\*24  
 tapping for sap, 2-\*235, †236  
**Sugar palm**, 9-191

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



"Sugar-Plum Tree, The," by Eugene Field, 13-343

Sugar State, 8-146-A

Sui dynasty, China, 5-322

Sui Jin, in Chinese mythology, 5-314

Suicide, Japanese hara-kiri, 5-347, 358

Suiko, Japanese empress, 5-346

Suite, musical, 12-227

Sujin, legendary Japanese hero, 5-342

Sukarno, Achmed, Indonesian president, 5-529-B

Sulfa drugs, 10-547; 7-427; 9-219-B; 1-\*550

Sulla, Lucius Cornelius, Roman dictator, 5-219 and Caesar, 12-357

Sullivan, Anne, teacher of Helen Keller, 12-567

Sullivan, Sir Arthur, life; music, 12-256, 319-20 portrait, 12-\*319

Sullivan, Louis, ideas on architecture, 11-524

Sullivan, Robert, 13-567

Sully, Maximilien de Béthune, Duc de, 6-180

Sully, Thomas

"Mother and Son," painting, 11-\*367

portrait of Thomas Jefferson, 12-\*504

"Sully," ship, telegraph "discovered" on, 10-96

Sully's Hill Game Preserve, North Dakota, 8-302-A

Sulphate of ammonia, used as fertilizer, 7-451

Sulphate of lime, 1-54

Sulphate of potash, used as fertilizer, 7-455

Sulphite paper, 9-\*278-79

Sulphur, element

ancient ideas about, 1-281

chemical behavior, 1-547

effect upon silver, 9-390

found in proteins, 2-41

melting point, 1-\*392

mined in Sicily, 6-476

symbol, atomic no. and wt., 1-\*551

United States, 7-343-F

Texas, 8-385

united with iron, 1-552, 553

used in plastics, 10-552

used to vulcanize rubber, 9-268

Sulphur City, La., mining, 8-144

Sulphur-crested cockatoo, 4-\*192

Sulphur dioxide, chemical composition; uses, 1-553, 408

Sulphuric acid

manufacture, 10-548

used for cell, 1-496

used in storage battery, 1-498

Sulu Archipelago, P. I., map, 5-595

Sulu Sea, Philippine Islands, map, 5-595

Sumac, poison, lacquer from, 9-290

Sumac roots, dye from, 12-157

Sumatra, Island, East Indies, description, 5-†523-24, 529-B; *see also* index World War II, 6-493

flowers and animals, 5-524

argus pheasant, 4-187

maps, 5-596

natives and their crafts, 5-\*428, 430, 523, \*524, \*525

Sumatra—*continued*

once joined to mainland, 3-61

products, 5-529-B

rice growing, 9-\*109

Sumba (Sandalwood), island, Indian Ocean, map, 5-600

"Sumer and Akkad," name for Sumeria, 5-80

"Sumer is icumen in," old English canon, 12-213

Sumeria, ancient country, Asia, main article, 5-†75-82

archaeology, 5-\*11, †12, 14

excavations of cities, 5-\*75, †81

architecture, 11-23, 25, 404, 407

art, 11-†23-24, †25

goldsmithing and silversmithing, 12-79, \*81, 82

inlay, 12-109

pottery, 5-\*77

beginning of history in, 5-42

burial of dead, 11-24

city-states, 11-24

costumes, 9-5

famous kings, 5-80

gods worshipped, 11-404

knowledge of bronze, 12-13

language of people, 5-78, 82

laws: duties of kings, 5-86

life in, 5-78

location, 5-75

map, 5-\*76

mound cities, 5-76, 78

priest-kings, 5-78

principal cities, 5-80

relations with Semites, 5-78

seals, 11-25

Semitic conquest, 5-80, 82

Sumerians become one with Semites, 5-88

temple processions, 11-24

today a desert, 7-465

trade, 5-78, †80

writing: libraries, 5-†78

ziggurats, 11-23, 25

"Summary View of the Rights of America, A,"

by Thomas Jefferson, 12-504

Summer, cause and date of, 1-206, 210

position of sun during, 1-†111

"Summer," sculpture by Maillol, 11-\*389

Summer duck, 4-79

Summer forests, 2-196

Summer resorts, *see* Resorts

Summer savory, herb, 9-311

Summer White House, of President Coolidge, 8-364-A

Summer yellow bird, 4-59

Summerland, Calif., oil wells under ocean, 9-\*453

Sumter, Fort, in Civil War, 7-255

Sun, main article, 1-†108-18

Apollo god of, 1-109

belief that it went round the earth, 13-393, 394

calendar regulated by, 10-†477, 479 fol.

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Sun**—*continued*

- change of seasons explained, 1-†111, †201-3, 206, †208:10  
 chromosphere, 1-118  
 composition, 1-109  
 corona, 1-117  
 distance from earth, 1-14, \*112, †115  
 earth held in place by, 1-15  
 earth's revolution around, 1-\*201, †202-3  
 eclipse, 1-108, †116-18, \*204  
   ancient predictions, 5-160  
   how recorded, 1-188  
   Tycho Brahe inspired by, 13-\*394  
 ecliptic (annual path), 1-177  
 energy from, 1-341, †343-52  
   efforts to obtain directly, 1-\*348, \*350  
   in food, 2-366  
   stored in coal, 1-†343-46; 9-438  
 fire caused by rays, 1-115, \*116  
 gases, 1-110, 113  
 gravitation, 1-15-16, 112, 302, 303  
 Greek myth about, 14-413  
 heat, 1-4, 110, 113, 115, 386  
 heat waves, 1-399  
 midnight sun, 6-407-A; 10-\*476  
 movement, 1-\*111, 113, †114, \*118  
 photographs of, 1-\*420  
 photosphere, 1-117  
 precession of the equinoxes, 1-180  
 prominences, 1-116, 117  
 relation of planets to; 1-\*7, †105-6, \*150  
   how planets were born, 1-\*5, †6-9  
   planetary movement, 1-†288-90  
 rotation, 1-133  
 shape, 1-\*5, 6  
 size, 1-110, \*112  
 source of heat and light, 1-†108-18, 207, 559  
 spectrum, 1-†187  
 starlight attracted by, 1-†427; 13-409  
 temperature, 1-\*392  
 theories of origin and nature, 1-3, 6, 7  
 tidal effect, 1-134  
 time reckoned by, 10-460-61, †469, †470, †471, 472, 473  
 weather forecasting by, 1-†266  
 weather governed by, 1-204  
 weight, 1-\*112  
 why it is not aflame, 10-336  
*see also* Solar system; Sunlight  
**"Sun," New York**, beginning of, 7-242  
**"Sun also Rises, The,"** by Hemingway, 13-351, 352  
**Sun bath**, 2-291, 414, 418  
**Sun dogs**, 1-272  
**Sun gods**, 5-55, 86, \*87  
**Sun King** (Louis XIV), king of France, 12-411  
**Sun River**, U. S., 8-220  
**Sun scalding**, injury of trees, 2-31  
**Sun spots**, 1-\*110, †113 *fol.*  
   affect magnetic poles, 1-489  
**Sun starfish**, 3-\*128  
**Sun time**, measuring and recording  
   at sea; "shooting the sun," 10-\*300  
   calendars, 10-†475-83  
   Egyptian shaft, 10-\*468  
   regulates all of time, 10-469-73  
   sundial, 10-†460-61  
**Sun treatment of disease**, 1-\*200; 2-291  
**Sun worship**, 10-\*475  
   Aztecs, 7-91  
   Egyptians, 5-49, 55; 11-16  
   Incas, 5-495; 7-92  
   Persians, 1-109  
**Sun Yat-sen**, leader of Chinese Revolution, 5-†331, 334, 335  
**Sunbills**, birds, color plate, 4-\*185  
**Sunbirds**, 4-180  
**Sunburn**, 2-288  
   avoidance of, 2-414, 418  
   treatment, 2-404  
**Sunbury**, Ga., captured by British, 8-79  
**Sunda Islands**, Malay archipelago, map, 5-596  
**Sunda (Flores) Sea**, East Indies, map, 5-596  
**Sunday**  
   not universally observed, 14-577  
   observance in colonial New England, 7-150  
   origin as Christian day of rest, 14-582  
   origin of name, 10-483  
**Sundew**, plant, insects eaten by, 2-†61  
**Sundials**, 10-†460, †461  
   obelisks as pointers for, 10-\*468  
**Sunfish**, 3-206, \*208, †228  
**Sunflower**, why it faces the sun, 14-441  
   Kansas' state flower, 8-132  
**Sunflower (daisy) family**, 2-175  
**Sunflower State**, 8-132  
**Sunflowers**, people of Kansas, 8-132  
**Sung dynasty**, China, 5-327  
**Sungari River**, Manchuria, tributary of the Amur, length, 10-253  
**Sunlight, causes and effects**, main article, 1-†199-204  
   colors in, 1-199  
   curative qualities, 2-291, 414, 418; 1-\*200  
   effect upon color, 10-446  
   effect upon plants, *see* Light, effect upon plants  
   effect upon skin, 2-288  
   focused by burning glass, 1-†430, 432, 115, 209  
   if there were none, 1-2  
   importance to life, 1-199; 2-321  
   in art, *see* Light and shadow in art  
   on moon, 1-\*122, 123, \*136, 140, \*141  
   refraction  
     by water, 1-87  
     causes rainbow, 1-271  
     due to atmosphere, 1-208, 427, \*431  
   Spain: effect upon art, 11-241  
   time it takes to reach earth, 1-417  
   *see also* Light; Sun  
**Sunnites**, Islamic sect, 5-398  
**Sunnyside**, Washington Irving's home, 13-285

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- "Sunrise: An Impression,"** painting by Monet, 11-347
- Suns of the night (stars),** main article, 1-†169-80; *see also* Stars
- Sunset Crater, Arizona,** volcanic formation, 7-417
- Sunset Crater National Monymnt, Ariz.,** 8-24-A
- Sunset State,** nickname for Arizona, 8-24-A
- Sunsets**  
cause of colors, 1-220  
meteoric dust, 1-167  
volcanic dust, 1-76, 235
- "Sunshine in Mariposa,"** by Leacock, 13-580
- Sunshine Mine,** at Kellogg, Idaho, 8-†90
- Sunshine recorders,** 1-†274, 276
- "Sunshine Sketches,"** by Leacock, 13-580
- Sunshine State,** nickname for  
New Mexico, 8-262-A  
South Dakota, 8-364-A
- Sunstroke,** treatment for, 2-404
- Suomi,** native name of Finland, 6-456
- Superdreadnaughts,** battleships, 7-483
- Superior, Lake, No. Amer.;** area, 8-446  
connected with Lake Huron, 10-274  
Duluth chief port, 10-260  
elevation, 8-186-A  
fishing in, 8-445  
map, 7-595  
ports, 8-440, 444  
silver found under lake, 9-388  
trading posts, 8-440
- Superior, Wis.,** 8-444
- Superior oldland, U. S.,** 7-343-C; 8-438
- Supersonic flight,** 10-†328-S
- Superstitutions**  
about the weather, 1-267  
Afghans, 5-431  
African Negroes, 5-446  
American Indian, 7-91, 94, 100, 102  
cave men, 5-32  
divining rod, 1-†90  
eclipse, 1-118  
gems, 9-433  
ground hog, 4-371  
Hallowe'en, 14-586  
owl, 4-163  
weather forecasting, 1-267-68  
witchcraft, 7-†148
- Supply and demand,** 7-545  
gold, 7-513
- Supremacy Act,** England, 6-45
- Supreme Council,** governing body of Russia, 6-443-B
- Supreme Court, United States,** organization:  
powers, 7-366  
Andrew Jackson's opposition to, 7-226  
chief justice; John Marshall's work, 7-†366, 367  
decisions in favor of Indians, 7-226  
decisions on New Deal measures, 7-341-B  
importance, 7-367
- Supreme Court, United States—continued**  
state, *see subhead* political facts listed under various states  
throws out "New Deal" legislation, 7-343
- Supreme Court Building,** 11-†523
- Suq,** street of bazaars, in Jiddah, 5-417
- Surat, India,** first English trade settlement at, 5-378
- Suresnes,** near Paris, cemetery, 14-†575
- Surf-board riding,** Hawaii, 8-†457
- Surface film on water,** 3-258
- Surface (square) measure,** 10-375
- Surface tension,** of liquids, 1-†360
- Surgeons,** *see* physicians and surgeons
- Surgery**  
antiseptics, introduced into, 13-372  
bone, 2-324  
catgut used in, 13-372.  
Dr. Hunter a pioneer in, 13-364  
modern, 2-†369  
performed by barbers, 13-364  
sterilization, 10-568; 13-372
- Surinam, toad,** 3-†426
- Surplus,** territorial division, Maine, 8-156
- "Surprise Symphony,"** by Joseph Haydn, 12-274
- "Surrender of Breda,"** painting by Velasquez, 11-254
- Surrey, Thomas Howard,** earl of, 6-119
- Surveying,** 10-436  
camera's work in, 10-452
- Survival of the fittest**  
Darwin's theory, 13-436  
plants, 2-190, 204
- Susa, Persia**  
capital of Cyrus the Great, 5-103  
conquest of, by Alexander of Macedon, 12-349
- Susitna River, Alaska,** 8-16
- Suspension bridges,** 10-212, †213, †214
- Suspension railways,** 10-†199
- "Suspiria de Profundis,"** by Thomas De Quincy, 13-233
- Susquehanna community,** dream of Southey and friends, 13-219
- Susquehanna River, U. S.,** 8-341  
Chesapeake Bay once valley of, 8-162  
New York, 8-283
- Susquehannock Indians,** in Maryland, 8-159
- Sussex, England,** muddy roads, 10-152
- "Sussex,"** ship, sunk in World War I, 7-320
- Suttee,** burning of widows in India, 5-375, 383
- Sutter, Fort, Sacramento, Calif.,** 9-†393
- Suwanee River, Ga. and Fla.,** 8-76
- Sven Estrithsson,** king of Denmark, 6-410
- Sven Forkbeard,** of Denmark, defeats Olaf Tryggvesson, 6-393, 409
- Sverker, the Old,** king of Sweden, 6-394
- Sverre Sigurdsson,** king of Norway  
gains crown of Norway, 6-384  
grandson of, 6-†379
- Swahili,** African coast people, 5-445
- Swains Island, Samoa,** 8-467
- Swainson's lorikeet,** bird, color plate, 4-†184

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Swallow**, bird, 4-†33-38, color plate, \*88  
 nest building and breeding, 4-\*33, †34  
 cliff swallow, 4-\*37, \*38  
*see also varieties, as Barn swallow, etc.*  
**Swallow-tail butterfly**, black, 3-\*288  
**Swallow-tailed kite**, bird, 4-157  
**Swallowing**, process of, 2-353  
 aid to hearing, 2-304  
 and breathing, 2-341  
**Swamp pine**, yields turpentine and rosin, 9-309  
**Swamp sparrow**, 4-101  
**Swamp State**, nickname for South Carolina, 8-356-A  
**Swamps**, 3-\*27  
 and formation of coal beds, 3-†27; 9-436, †437  
 draining causes extinction of birds, 7-468  
 Florida, 8-71, 76  
 in spring, 4-100  
 Louisiana, 8-146  
**Swan**, **Joseph**, process for making artificial silk, 9-83  
**Swan**, bird, 4-\*113, \*118, \*119, \*121; 9-\*353, 359  
**Swan**, constellation, star maps:  
 July and August, 1-178-G, 178-H  
 May and June, 1-178-E  
 Nov. and Dec., 1-178-K  
 Sept. and Oct., 1-178-I, 178-J  
**Swan mussel**, 3-261  
 pearls in, 3-262  
**"Swanee River,"** song, 8-138-B  
**Swanquarter Migratory Bird Refuge**, N. C., 8-296-A  
**Swastika**, 12-16  
**Swastika flag**, 6-240  
**Sweat**  
 content of, 2-367  
 evaporation of, 2-293  
**Sweat glands**, 2-289, \*290, 293  
 skin, 2-366, 367  
**Sweatshops**, 7-435, \*436  
**Sweden**, description and history, main article, 6-†392-407; general data, 6-407-A-407-B;  
*see also index World War II*, 6-493  
 area, 6-407-A  
 canals, 10-\*270  
 climate, 6-407-A  
 common people, 6-394, 395  
 Gustavus Vasa and, 6-397  
 kitchen of home, 6-\*406  
 revolt, 6-396  
 cooperative societies, 7-553  
 costumes, 6-\*392, \*398, \*402, \*404; 9-\*2  
 hoods, 9-\*95  
 divisions, 6-407-B  
 flag, color plate, 14-following 570, no. 60  
 folk dancing, 6-\*404  
 Glacial Age, 3-60  
 government, 6-407-B  
 history, 6-†392-407  
 Kalmar Union of Scandinavian countries, 6-386, 396, 411, 412  
**Sweden—continued**  
 wars with Denmark, 6-397, 400 fol., †412  
 wins freedom from Denmark, 6-398  
 wars with Poland, 6-400, 401, 403, 405  
 Thirty Years' War, 6-400  
 wars with Russia, 6-403, 406, 407  
 Age of Freedom or Age of Anarchy, 6-405  
 rule of Latvia, 6-462  
 Constitutions, 6-405, 406, 407  
 provinces won by Russia, 6-430  
 Finland won and lost, 6-456  
 union with Norway, 6-386 fol., 396, 407  
 wins Schleswig-Holstein and Jutland, 6-402  
 separation from Norway, 6-390, 407  
 rôle in World War II, 6-407  
 Island of Gotland made part of, 6-395  
 literature, 6-407  
 location, 6-407-A  
 maps, 6-596  
 on map of Europe, 6-570  
 modern progress and prosperity, 6-407  
 mountain upheaval in, 1-21  
 people, 6-407-B  
 physical features, 6-407-B  
 products and industries, 6-407  
 religious history, 6-393, 396, 398, 400  
 rivers, 10-259  
 settlements in New World  
 Delaware, 7-†128; 8-64  
 Elfsborg, N. J., established by, 8-250  
 Pennsylvania, 8-334  
 storehouse on stilts, 6-\*403  
 trade  
 Goteborg, 6-\*403  
 merchant marine, number, 10-232  
 trade restrictions abolished, 6-407  
 Visby, 6-395  
 water power and electricity, 6-406, 407  
 winter sports, 6-\*404  
**Swedenborg**, Emanuel, philosopher, 6-407  
**Swedish literature**, 6-407  
**Swedish Nightingale** (Jenny Lind), 12-\*252, 579  
**Sweet corn**, 9-106, \*151  
**Sweet-gum**, tree, 2-\*274  
**Sweet marjoram**, herb, 9-311  
**Sweet pea**  
 breeding of, 2-228  
 flower parts, 2-\*103  
**Sweet pepper**, vegetable, 9-150  
**Sweet potato**, 9-143, 145, \*151  
**Sweet-potato plant**  
 an edible morning-glory, 2-174  
 flower structure, 2-\*172  
**Sweet William**, 2-164  
**Sweetbriar College**, Sweetbriar, Va., 8-417  
**Sweetwater River**, Wyoming, 8-454  
 discovery of gold on, 8-451  
**Swell organ**, 12-258-D  
**Sweynheym**, Conrad, 10-51  
**Swift, Jonathan**, life and works, main article, 13-†177-79  
 a great satirist, 14-344

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Swift, Jonathan**—*continued*  
 contemporaries, 6-76  
 "Gulliver's Travels," 14-†343-352  
 Pope and, 13-184  
 portrait, 13-\*177  
 story-telling ability, 14-343
- Swift, bird**, 4-†38-39, 32
- Swift, lizard**, 3-†456-57
- Swim bladder of fish**, 3-195, \*196
- Swimmerets of lobster**, 3-186
- Swimming**, main article, 14-†534-40  
 dangers to be avoided, 14-540  
 diving, 14-†537-39  
 experts in bird family, 4-149, 196, 208, 211, 219, \*220, 238  
 life-saving, 2-†408-10  
 safety precautions, 2-428  
 strokes, 14-†535, †536, 540
- Swinburne, Algernon Charles, life and works**,  
 main article, 13-†258-59  
 portrait of Swinburne children, 13-\*258  
 translations by  
   François Villon's poem, 13-105  
   Sappho's poems, 13-30
- Swine**, *see* Hogs
- "Swing low, sweet chariot,"** Negro melody, 12-256, 310
- Swiss, people**, *see* Switzerland
- Swiss cheese**, 9-348
- Swiss Confederation**, 6-247 fol.
- Swiss guards**, 6-\*468  
 memorial to, at Lucerne, 6-250
- Swiss lake dwellers**, civilization, 5-\*33-35, 36-40; 6-244, \*245  
 bread made by, 9-238  
 cattle kept by, 9-331  
 dwellings, 5-\*34, 36; 6-244; 9-†40; 11-397  
 linen, 9-46  
 plants used by, 9-46, 97, 119, 166
- Switch, electric**, working of, 1-\*514
- Switch, railroad**, 10-\*187
- Switchboard**, telephone, 10-\*108
- Swithin, Saint**, 1-268  
 St. Swithin's Day, rain forecast, 1-267
- Switzerland**, country, Europe, **description and history**, main article, 6-†243-54; general data, 6-254-B  
 Alpine peaks, 6-\*254-A  
 area, 6-254-B  
 climate, 6-254-B  
 costume, 9-\*23  
 discovery of lake village, 5-36  
 flag, color plate, 14-following 570, no. 61  
 furniture, 12-\*187  
 geographical position, 1-24  
 government, 6-254-B  
**history**, 6-†243-54  
   early peoples, 6-243, \*245, 246  
   Roman rule, 6-244  
   under Austrian Hapsburgs, 6-247-50  
   Austrian rulers driven from, 12-375  
   Everlasting League, 6-248
- Switzerland, history**—*continued*  
 beginning of independence, 6-250  
 relations with France, 6-249, 250, 253  
 Reformation; religious wars, 6-251, 254  
 Helvetic Republic, 6-253  
 neutrality guaranteed; international<sup>p</sup> headquarters, 6-254  
 present republic established, 6-254  
   Constitution; government, 6-253, 254  
 language, 6-254-B  
 location, 6-254-B  
 maps, 6-584  
   on map of Europe, 6-570  
 official languages, 6-243  
 origin of name, 6-248  
 peasants, 6-\*249, †251 fol.; 9-\*23; 10-\*131  
 people, 6-254-B  
 physical features, 6-254-B  
 porcelain stove, 12-\*58  
 products and industries, 6-254  
   cattle herding, 9-345  
   cheese making, 6-\*249; 9-\*345, 348  
   lace, making, 12-\*166  
   stained glass made in, 12-\*74, 77  
 provinces, 6-254-B  
 reforestation, 2-242  
 rivers, 6-254-B  
 soldiering, 6-250  
 telegraph and post office of Liechtenstein run by, 6-467  
 tobogganing, 14-483  
 tunnels, 10-†203  
 vegetation, 6-254-B
- "Switzerland of America,"** 8-52-B
- Sword guards**, Japanese, 12-\*88
- Sword sucker**, new shoot of banana, 9-183
- Swordfish**, 3-\*199, †205
- Swords**  
 carving of, 12-\*99, 100, \*102  
 fencers' foils, 14-512  
 honored during Heroic Age, 14-310  
 iron, 5-91, 115; 12-2, 4  
 knights, 14-512  
 magic, in Arthurian romances, 14-\*379, \*396  
 names given to, 6-375
- Swordsmanship**, in war; as a sport, 14-512
- "Sybil,"** by Benjamin Disraeli, 12-441
- Sycamore** (buttonball), tree, 2-\*274
- Sycamore maple**, extreme age, 2-260
- Sydney, Algernon**, English political writer, 8-176-B
- Sydney, Australia**, 5-556, \*549; 10-\*244  
 commonwealth proclaimed by, 5-560  
 rivalry with Melbourne, 5-560-A  
 settlement, 5-548  
 steel bridge, 10-214  
 university, 5-558, \*560-E
- Sydney University**, Australia, 5-558, \*560-E
- "Sylvania,"** meaning, 8-342
- Symbiosis**, plant, 2-†58  
 lichens an example of, 2-79
- Symbolic drama**, 12-333

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Symbolism**, in Chinese art, 12-\*97, 100  
**Symbolism, Christian**, 11-27, 74, 77; 13-527  
 Heaven symbolized, 11-†89  
**Symbols**, of chemical elements, 1-551  
**Symington, William**, "Charlotte Dundas," 10-\*219, 220  
**Symmachus**, Roman senator, 13-58  
**Symmes, John Cleves**, 8-307  
**Symonds**, early deputy governor in New England, 11-498  
**Symphonic poems**, 12-246  
 invented by Liszt, 12-298  
 Richard Strauss, 12-315  
**Symphonies**, musical compositions, 12-225, 235-37  
 Beethoven, 12-240.  
 Symphony in D minor, by César Franck, 12-254  
**Symphony orchestra**, arrangement of, 12-\*248  
**Synagogue**, ancient, music in, 12-204, 205  
**Synapse**, of nerves, 2-395  
**Synchromesh gears**, 10-\*289  
**Synchrotron**, in atomic research, 1-558-H  
**Syndicalism Laws**, Criminal, 7-334  
**"Syndics of the Cloth Hall. The,"** painting by Rembrandt, 11-\*275, 277  
**Synthetic chemistry**, 10-545  
**"Synthetic Philosophy,"** by Herbert Spencer, 13-25  
**Synthetic products**  
 amber, 9-446  
 camphor, 10-552  
 cellulose products, 9-84, 86, 293-94  
 dyes, 9-306  
 ice, 10-515, \*517  
 ivory substitute, 2-129, 255, 256  
 pearls, 3-164; 12-32  
 perfumes, 9-300, 302  
 plastics, 10-545, 547  
**Synthetic products**--*continued*  
 rayon, 9-†83-86  
 rubber, 9-271, 271-A, 271-B; 10-545  
 rubies, 9-432  
 saccharine, 9-445  
 sapphires, 9-433  
 silk, artificial, 9-83  
 tannin, 9-68  
 vanillin, artificial vanilla, 9-208  
**Syphilis**, disease, 2-21  
**Syracuse, N. Y.**, industries, 8-281  
**Syracuse, Sicily**, cathedral in, 6-\*474  
**Syria**, country, Asia, people and life in, 5-\*108  
 Aleppo galls, 9-307  
 animal life; hyraxes, 4-345  
 flag, color plate, 14-following 570, no. 62  
 gains independence, 5-\*108  
 glass, 12-27, \*33  
 ivory carving, 12-\*09, \*101  
 map, 5-582, 580  
 revolt of Palestine, 5-129  
 under Roman control, 5-222  
**Syriac numerals**, 10-\*422  
**Syrian bear**, 4-\*316  
**Syrian glass**, 12-\*33; glassblowing, 12-27  
**Syrians**, *see* Arameans  
**Syringa**, flower, 8-92-B  
*Syringa vulgaris*, 8-242-B  
**Syrinx**, musical instrument, 12-206  
**Syrinx**, nymph, 12-206  
**Syrup**, glucose used in, 10-547  
**"Systema Naturae,"** by Linnaeus, 13-411  
**Systematic botany**, 2-3  
**Systemic circulation** of blood, 2-374  
**Systole**, heart contraction, 2-373  
**Szatmar, Peace of**, 6-284  
**Szechwan**, province of China mountains, 5-336-A  
**Szigetvár, siege of**, 5-\*413, 6-\*280  
**Szu-ma Ch'ien**, China's Herodotus, 5-321



- T.N.T.**, abbreviation for trinitrotoluene, 10-418  
**T'a Chi**, cruel Chinese woman, 5-317  
**Taban (gutta) tree**, yields gutta-percha, 9-309  
**Tabard Inn**, scene "Canterbury Tales," 14-†329  
**Tabasco**, state, Mexico, map, 7-597  
**Tabby**, variety of cat, 4-488  
**Tabernacle** of Israelites, adornment, 12-79  
**Tabernacle**, Mormon, 8-389  
**Table Bay**, South Africa, 5-476  
**Tables**, furniture, 12-176, 179 fol.  
 billiard, 14-478  
 Egyptian, for holy offering, 5-\*69  
 modernistic, 12-\*174  
**Tablets, clay**, *see* Clay tablets  
**Tableware**  
 glass, 12-27, 34  
 silver, *see* Silverware  
**Taboos**  
 African tribes, 5-446  
 Eskimo, 7-36  
 Hawaii, 8-457  
 prehistoric, 5-32, 39  
**"Tacit,"** origin of word, 13-56  
**Tacitus, life and writings**, main article, 13-†56  
 cited, 10-152  
 contemporaries, 5-242  
 describes German tribes, 6-205  
 portrait bust, 13-\*56  
**Tacking** of sailboat, 14-†528; 10-160  
**Tacna-Arica**, region, So. Amer., 5-510  
**Tacoma, Mount**, Washington, extinct volcano, 1-76  
**Taconic Mountains**, U. S., portion in Vermont, 8-404

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Taconite**, 9-408
- Tadpoles**  
newt, 3-428  
salamander, 3-†429  
toads and frogs, 3-†415 fol., \*222
- Tadpoles**, nickname for natives of Mississippi, 8-206-A
- Tadzhik Soviet Socialist Republic**, 6-443-B
- "Taeping,"** racing clipper ship, 10-172
- Taft-Hartley Act**, 7-343-B
- Taft, Helen Herron** (Mrs. William H. Taft), 12-564
- Taft, William Howard**, president, 12-456-E  
administration, 7-310  
election of 1912, 12-546  
governor of Philippines, 5-569
- Tag**, game, 14-172
- Tagua palm**, buttons made from nut, 9-51; *see also* Vegetable ivory
- Tagus River**, Spain, flowing across Spain and emptying into Atlantic at Lisbon, Portugal  
length, 10-253  
map, 6-590
- Tahiti**, island, Pacific Ocean, one of Society Islands, 5-528  
birds  
kingfisher, 4-†49  
warbler, 4-†58  
breadfruit, 9-212  
Gauguin's paintings of natives, 11-†386  
transit of Venus observed by Captain Cook, 13-489  
vanilla grown on, 9-207
- "Tahiti,"** ship, sinking of, 10-73
- Tahoe, Lake**, located in Sierra Nevada, 8-42
- Tahr**, goat, 4-†423, \*427, 430
- T'ai Tsu** (Hung Wu), Chinese emperor, 5-329
- T'ai Tsung**, Chinese emperor, 5-324
- Taikwa**, Japanese period, 5-346
- Tail**, of animals  
anteater, 4-450  
lizard, 3-448  
long-tailed pangolin, 4-456  
monkey, 4-†252, 262  
squirrel, 4-366  
whale; development into fluke, 4-442  
yak, 4-398
- Tail coverts** of peacock, 4-188, \*191
- Tail plane**, 10-†328-K
- Tailed moth** of Madagascar, 3-290
- Tailor birds**, 4-182
- T'ai-p'ing Rebellion**, China, 5-332
- Taira**, Japanese clan, 5-349
- Taiwan** (Formosa), island, China Sea  
camphor production, 9-†218, 219  
maps, 5-593, 581
- Taj Mahal**, mausoleum, Agra, India, 11-†450; 5-†366, 375; 9-†432; mosaic work, 12-114
- Tajik Soviet Socialist Republic**, 5-336-D
- Takin**, goat, 4-430
- "Taking of the Redoubt, The,"** by Prosper Mérimée, 13-131
- Taku River**, North America, 8-16
- Talbot, Charles**, *see* Shrewsbury, Charles Talbot, duke of
- Talbot, William Henry Fox**, 10-448
- Talc**, mineral, 8-403
- "Tale of a Tub, The,"** by Jonathan Swift, 13-178
- "Tale of Two Cities, The,"** by Dickens, 13-245
- "Tales from Sebastopol,"** by Count Leo Tolstoy, 13-91
- "Tales from Shakespeare,"** by Charles and Mary Lamb, 13-224
- "Tales of a Traveller,"** by Washington Irving, 13-294
- Talim**, pattern for rug weaving, 12-156
- "Talisman, The,"** by Sir Walter Scott, scene from, 12-†372
- Talismans**, gems used as, 12-105
- Talk**, value of, to victims of shock, 2-399
- Talking**, *see* Speech
- Talking book**, 10-560
- Talking machine**, main article, 10-†497-500; *see also* Phonograph
- Talking pictures**, 10-504, \*506  
and legitimate theater, 12-334
- Tall cans**, buoys, 10-†227
- Tall nuns**, buoys, 10-†227
- Tallahassee**, Fla., 8-68  
capitol building, 8-†68  
shipping, 8-74
- Tallahatchee River**, Miss., length, 10-255
- Tallapoosa River**, U. S., 8-8  
Georgia, 8-84
- Tallboy**, chest of drawers, 12-198
- Talleyrand, Charles Maurice de**  
Napoleon betrayed by, 14-503  
quoted, 12-510  
XYZ Affair, 7-198
- Tallies**, medieval, for recording debts, 10-†423
- Tallinn** (Reval), Esthonia, 6-†459, \*462, 463
- Tallman, Maianna, Mrs.**, song by, 8-347
- Tallyho**, coach, 10-†147
- Talma, François Joseph**, French actor, 12-332
- Talmud**, body of Jewish law, 5-133
- Tamandua**, anteater, 4-451
- "Tamar,"** poem by Robinson Jeffers, 13-353
- Tamarack** (larch), tree, 2-99, \*267  
wood, 9-258
- Tamarind**, tropical fruit, 9-196
- Tamarisk**, plant, 9-214
- Tamaulipas**, state, Mexico, map, 7-597
- Tambour** (limerick), lace, 12-172
- Tambourin**, distinguished from "tambourine," 12-258-C
- Tambourine**, musical instrument, 12-258-C, †203, \*239
- "Tamburlaine,"** by Christopher Marlowe, 13-163
- Tamerlane** (Timur), Mongol conqueror  
defeats Turks, 5-411  
in India, 5-374  
Samarkand the capital of, 5-435

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

- Tamils**, people of Dravidian race  
 Ceylon, 5-387-B  
 India, 5-387-A  
**"Taming of the Shrew,"** by Shakespeare, scene from, 13-\*159  
**Tammany Hall**, corruption, 7-281  
**Tampa**, Fla.  
 industries, 8-74  
 resort city, 8-74  
**Tampa Bay**, Florida, De Soto's landing, 13-†465  
**Tan**, Chinese sage, 5-318  
**Tan**, skin  
 causes, 1-200  
 sun tan, 2-288  
**Tana**, Lake, Africa, 5-461  
**Tanagers**, bird family, 4-180; *see also* Scarlet tanager  
**Tanagra figurines**, pottery, 12-53  
**Tanana River**, Alaska, 8-16  
**Tanbark**, uses, 2-264  
**Tanbark oak**, 2-\*29  
**Taney**, Roger Brooke, Dred Scott Decision, 7-250  
**T'ang**, Chinese emperor, 5-316  
**T'ang dynasty**, China, 5-324  
**Tanganyika**, Lake, Africa, 5-464  
 length, 5-473-A  
 map, 5-576  
**Tanganyika Territory**, Africa, 5-461, 462, 464  
 map, 5-576  
**Tangerine**, fruit, 9-173  
**"Tanglewood Tales,"** by Nathaniel Hawthorne, 13-299  
**Tank**, army, 10-\*368-A-368-F; 7-\*318; 12-\*548  
**Tank trucks** for milk, 9-\*337  
**Tanka**, Japanese verse, 5-346, 349  
**Tankard**, silver, 12-\*91  
**Tankers**, oil, 9-454; 10-\*235  
 loading of, 10-249  
**Tannenberg**, Battle of, 6-448  
**"Tannhäuser,"** opera by Richard Wagner, 12-216, 251, 295  
**Tannic acid**, *see* Tannin  
**Tannin**, chemical, sources and uses, 2-264; 9-68, \*70  
 in tea, 9-138  
**Tanning** of leather, 9-†66-68, †70-71  
**Tansy**, plant, 2-\*173  
**"Tantalize,"** origin of word, 14-455  
**Tantalum**, element, symbol, atomic no. and wt., 1-\*551  
**Tantalus**, mythological character, 14-455 *α*  
**Tanyu**, Japanese artist, 5-359  
**Taoism**, religion, 5-319; 13-517  
**Taormina**, Sicily, 6-†473  
**Taos**, Indian village and artists' colony, New Mexico, 8-261  
**"Tao-te-king,"** by Lao-tse, 13-517  
**Tap root**, 2-38  
**Tapestry**, main article, 12-†137-44  
 Biblical, 12-140  
 carpet, 12-158, 161  
**Tapestry—continued**  
 Chinese, 12-\*138, 140  
 colors and dyes, 12-141  
 designs for, 12-138, 142; 11-308  
 earliest, 12-140  
 Flemish, 12-142  
   imitated in carpets, 12-159  
 Flemish centers of weaving, 11-197, 201  
 French, 12-†143  
 Gobelins, 12-†139, †142 fol.  
 gold woven into, 12-144  
 Gothic, 11-\*100, 103  
 in medieval castles, 5-305  
 Italian, 12-\*137, 142  
   weaving of, 12-138  
**Tapeworms**, ferns used to kill, 2-92  
**Tapioca**, food, 9-211  
**Tapirs**, animals, 4-†348-50  
   in Tertiary period, 3-\*47  
**Tapissiers**, tapestry weavers, 12-137  
 guilds, 12-141  
**Tapping of trees**  
 latex (fluid containing rubber), 9-264, \*265, 266  
 maple sugar, 2-†236; 9-†122 fol.  
 resin, 9-313  
 turpentine, 8-\*73  
**Tar**, coal, 9-444  
   synthetic substances made from, 9-307, 445  
**Tar-heel State**, nickname for North Carolina, 8-296-A  
**Tar-heels**, people of North Carolina, 8-296-A  
**Tar lake**, Trinidad, 7-66  
**Tar oil**, 9-454  
**Tar River**, N. C., 8-296  
**Tara**, Irish Free State, made capital of Connaught, 6-144  
**Tarahumare Indians**, 7-\*81  
**Taranto**, Gulf of, Italy, map, 6-589  
**Tarantula**, spider, 3-\*410, 411  
**Tarascan Indians**, 7-83  
**Tarbell**, Ida Minerva, 7-308  
   "History of the Standard Oil Company" by, 12-583  
**Target**, how to make, 14-†49  
**Target practice**, U. S. Army, 7-\*475  
**Tarifa**, Cape, location, 6-162-C  
**Tariff**, 7-514  
   Canada's problems, 7-27, 29-B  
   United States  
     acts of 1828 and 1832; protest of South against, 7-224, 225  
     bill of 1846, 12-456-E  
     Calhoun's attitude, 12-521  
     Clay's attitude, 12-518  
     Cleveland's effort to reduce, 7-288  
     customs duties, 7-513, 514  
     effect on trade, 7-576  
     Dingley-Tariff Act, 12-456-D  
     Fordney-McCumber Tariff Act, 12-456-C  
     Hawley-Smoot Tariff Act, 12-456-D  
     McKinley Tariff, 7-289, \*302; 12-456-C  
     Payne-Aldrich Tariff, 7-310; 12-456-E

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



- Tariff**, United States- *continued*  
 South Carolina's interest in, 8-352  
 Underwood Tariff, 7-315  
**"Tariff of abominations,"** 7-224  
**Tarim**, river, Asia, 5-436  
**Taro**, plant, 2-151  
**Tarpan**, wild horse, 4-514  
**Tarpeia**, Roman maiden, 7-349\*  
**Tarpon**, fish, 3-\*213  
**Tarpon Springs**, Fla., sponges shipped from, 3-\*82, 86  
**Tarquin the Proud**, legendary king of Rome, buys Sibylline Books, 5-207  
**Tarquins**, legendary kings of Rome, 5-199, 200, 201  
 driven out of Rome, 12-340  
**Tarred roads**, 10-\*155  
**Tarshish**, Biblical city, 6-318  
**Tarsis (Tartessos)**, ancient city, Spain, 6-318  
**Tartarin of Tarascon**, character by Daudet, 13-133  
**Tartars**, people, *see* Tatars  
**Tartarus**, in Greek mythology, 14-455  
**Tartary**, Gulf of, Asia, map, 6-603  
**Tartessos (Tarsis)**, ancient city, Spain, 6-318  
**Tartu**, University of, Esthonia, 6-464  
**"Tartuffe,"** by Molière, 13-112  
**"Task, The,"** by William Cowper, 13-213  
**Task force**, in Navy, 7-485  
**Tasman, Abel Jensen**, discovers New Zealand and Tasmania, 5-532, 533, †545  
**Tasmania**, island and state, Australia  
 colonization; government, 5-554  
 discovery, 5-532, 545  
 map, 5-601  
 native people, 5-544  
**Tasmanian devil**, animal, 4-†464  
**Tasmanian wolf**, 4-\*463, 464  
**Tasso, Torquato**, life and poems, main article, 13-†67-68  
 "Jerusalem Delivered," illustrated, 6-\*167  
 tapestry illustrating work of, 12-\*137  
**"Tasso,"** by Franz Liszt, 12-298  
**Taste**, sense of, 2-†307-9  
 classification of tastes, 2-307  
**Taste buds** of tongue, 12-307, 308, 309  
**Taste organs** in fishes, 3-242  
**Tatars**  
 invasions  
 China, 5-321, 327  
 Hungary, 6-280  
 Poland, 6-446  
 Russia, 5-270; 6-426  
 "Pure" Tatars (Manchus), 5-330  
**"Tatler,"** periodical of Addison and Steele, 13-181, 182  
**Taunton**, Mass., manufactures, 8-174  
**Taunton River**, Mass., power supplied by, 8-173  
 estuary, 8-347  
**Taupo, Lake**, on North Island, New Zealand, 5-541-B  
 map, 5-598  
**Taurus**, constellation, *see* Bull  
**Tawny-shouldered frogmouth**, Australian bird, 4-\*177  
**Tax commission**, Wisconsin, 8-445  
**Taxation**  
 American colonies' resistance to, 7-\*139, 160  
 Austria; poor, 6-260  
 duties and tariffs, 7-513, 514  
 England  
 Charles I, 6-63  
 Corn Laws, 6-95  
 of poor, 6-28  
 Parliament's consent necessary, 6-37  
 poll tax, 6-32  
 poor relief; England, 6-54  
 Richard II, 6-34  
 farming of taxes, 5-241; 13-381  
 Hungary; poor, 6-280, 281  
 resistance of Afghans and Turkomans to, 5-434, 435  
 tobacco, 9-224  
 United States  
 by states, 7-386  
 county, 7-389  
 customs duties, 7-513, 514  
 income tax, 7-315, 369, 376  
 inheritance tax, 7-376  
 internal revenue, 7-376  
 municipal, 7-401  
 powers of Congress, 7-361, 364  
 state automobile and gasoline taxes, 7-389  
 tobacco tax, 7-377  
**Taxation without representation** in American colonies, 7-160  
**Taxco**, Mexico, 7-\*78  
**"Taxicab,"** derivation and meaning, 10-22  
**Taxis, Francis von**, Count, 10-86  
**Taxonomy**, definition, 3-68  
**Taylor, Mrs.**, marries John Stuart Mill aids literary work, 13-239  
**Taylor, Deems**, 12-257  
**Taylor, Margaret Smith** (Mrs Zachary Taylor), 12-562  
**Taylor, Moses**, portrait, 10-\*101  
**Taylor, Nell Grayson**, "My Homeland, Tennessee" written by, 8-374  
**Taylor, Zachary**, president of the United States, 12-456-E  
 Buena Vista taken by, 7-238  
**Taylor's Falls**, log jam, 9-254  
**Tazza**, Venetian wineglass, 12-34  
**Tea and tea growing**, main article, 9-†134-40  
 Chinese industry, 5-317; 9-135  
 consumption in British Isles, 9-135  
 curing; processes that yield black and green tea, 9-†136, †138  
 introduced into Europe, 9-134  
 Japan, 9-\*136; 5-343  
 plantation, 5-\*343  
 significance, 9-\*134  
 tea ceremony, 9-139; 5-\*360  
 tea masters, 9-139

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Tea and tea growing**—*continued*

- kinds, 9-136
- preparation and use in Tibet, 5-440
- taxed in American colonies, 7-157, 161
- transportation in clipper ships, 10-172
- United States, 9-135
- ways of serving, 9-\*134, 139
- Tea caddy**, 12-\*91
- Tea ceremony**, Japan, 9-139; 5-\*360
- "Tea Leaves,"** painting by William M. Paxton, 11-\*367
- Tea party**, Boston, 7-\*159, 162
- Tea party**, held in Annapolis, Md., 8-160
- Tea plantation**, Japan, 5-\*343
- Tea set** in appliqué work, how to make, 14-†73
- Tea taster**, 9-\*139
- Teach**, Edward ("Blackbeard"), pirate, 8-288
- Teachers**
  - Agassiz, 13-433
  - aided by libraries, 10-559
  - Aristotle, 13-†9
  - Descartes, 13-13
  - Helen Keller, 12-567
  - Middle Ages; trained in monasteries, 5-278
  - Plato, 13-†7
  - Pythagoras, 13-4
  - Socrates, 13-†5
  - training schools, *see subhead* educational institutions listed under various states for list of teachers colleges
- Teaching**, importance of, 7-400
- teaching child arithmetic, 10-429 fol.
- Teakwood**, 9-258
- furniture, 12-\*187
- Teal**, duck, 4-119
- color plate, 5-\*76
- Teapot**
  - insulated handle, 1-†396
  - Japanese ceremonial, 12-100
  - Japanese porcelain, 12-\*57
  - silver, 12-\*89, \*91
- Teapot Dome** oil field, Wyoming, 8-452
- Teapot Dome scandal**, 12-456-C
- Tear bottles**, 12-28
- Tear ducts**, 2-\*292
- Tear gas**, 10-364
- made from phenol, 9-446
- Tear glands**, 2-\*292, 299, 300
- Tear sac**, 2-\*299
- Tears**, 2-299; cause and uses, 2-292
- Teasdale**, Sara, poet, 13-352
- Teazle**, Lady, Sheridan's heroine, 13-307
- Technetium**, element, symbol, atomic no. and weight, 1-\*551
- Technological unemployment**, 7-545
- Tecumseh**, Indian chief, 8-6
- "Tecumseh,"** ship, in Battle of Mobile, 7-264
- "Teddy bear"**
  - named for Theodore Roosevelt, 12-547
  - resemblance of koala to, 4-\*466, 467
- Tee**, on golf course, 14-495

**Teeter-tail** (sandpiper), 4-117**Teeth**, main article, 2-†311-16

- aid to digestion, 2-353
- animals, biologic evolution and specialization, 2-312
- cats, 4-286
- elephant, 4-338
- rodents, 4-364, \*373, 386
- care, 2-316, 421
- color plate, 3-\*135
- decay, prevention of, 2-363, 365
- effect of saliva upon, 2-355
- formation; composition, 2-\*313, 315
- names: location in jaw, 2-\*314
- number, 2-\*314, 316
- salt as a cleanser, 9-414
- section of tooth, 2-\*322
- Tegucigalpa**, capital of Honduras, 7-47
- temperature, 7-48-A
- map, 7-598
- Teheran**, or **Tehran**, city of Persia, 10-262
- "Big Three" meeting, 6-\*542
- map, 5-584, D5
- rainfall and temperature, 5-106
- rug market, 12-150
- Tehuantepec**, Gulf of, Mexico, map, 7-597
- Tehuantepec**, Isthmus of, Mexico, map, 7-597
- Te Kooti**, leader of Waikatos, 5-539
- Tel Aviv**, city in Israel, 5-\*140
- Telegrams**, game, 14-159
- Telegrams**, in cipher, 14-145
- Telegraph**, main article, 10-†94-99
- apparatus and its parts, 10-\*95, \*97, 98
- Bell's telephone, 10-112
- difficulties with Chinese language, 10-38
- inventions
  - Edison, 10-99; 13-442
  - Samuel Morse, 10-†96-98
- Telefax, 10-99
- telephotography, 10-\*94, 99
- United States, 10-99
- wireless, 10-115-16; *see also* Radio
- see also* Cables, submarine
- Telemachus**, story of, in "The Odyssey," 13-29
- Telephone**, invention and promotion, main article, 10-†108-13
- construction and operation, 1-†518-20
- equipment, in diving outfit, 10-522
- equipment manufactured at Kearny, N. J., 8-248
- for the deaf in theater, 11-510
- French telephone, 1-†518
- long-distance, 10-112, 113
- materials used in, 1-518
- nervous system compared to telephone system, 2-395
- number in United States today, 10-113
- principle on which it works, 10-110
- string-telephone, 1-†447
- switchboard, 10-\*108
- system a natural monopoly, 7-541, 542

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Telephone**—*continued*

transoceanic, 10-113, \*117  
wireless, 10-118; *see also* Radio  
wires, 10-\*108, \*112, 113

**Telephone receiver**, 1-518**Telephone screen**, how to make, 14-†53**Telephoto camera**, 10-452**Telephotography**, 10-\*94, 99**Telescopes**, astronomical, 1-185, \*188, \*189

adjusted movements, 1-186  
at Mount Palomar, California, 12-38; 8-42-A  
at Mount Wilson, California, 1-170, \*188  
for amateur astronomer, 1-\*180  
Galileo's, 13-396, 397  
gyroscope attached to, 1-291  
invention, 1-103; 13-401  
made by Herschels, 13-†403, 404  
use of camera with, 1-190

**Teletype**, device for sending messages, 10-\*99**Television**, main article, 10-†123-27-C

apparatus used in, 10-\*123, 124, †125, \*126-B  
plays, 10-\*123, 124

transmission and reception, 10-†125

**Telford, Charles**, builds macadamized roads, 10-152**Tell, William, story of**, 12-†374-75

defies Apollo, 6-\*246, 247  
monument at Altdorf, 12-375

**Tell, region**, Africa, 5-452**Tells (mounds)**, of Mesopotamia, 11-404**Tellurium**, element, symbol, atomic no. and wt., 1-\*551**Tempera**, method of painting, 11-114**Temperance**, *see* Prohibition**Temperance society**, women's first, 12-572**Temperate zones**, 1-204; 5-473-B

civilization in, 1-\*194, 196

**Temperature**, main article, 1-†206-11

absolute, 1-483  
affected by clouds, 1-237  
Alexandria, Egypt, 5-73-B  
Algiers, Algeria, 5-473-C  
and molecular motion, 1-388, \*403, 404  
and speed of sound, 1-446  
Asunción, Paraguay, 5-518-G  
Athens, Greece, 6-368-B  
Australia, 5-560-I  
automatic control of, indoors, 1-†476-78  
bacteria changed by climate, 2-15  
Batavia, Java, in Dutch East Indies, 5-529-B  
Bolivia, 5-518-D  
Bucharest, Roumania, 6-368-A  
Buenos Aires, Argentina, 5-518-G  
Cairo, Egypt, 5-73-B  
California deserts, 8-33  
Capetown, Union of So. Africa, 5-491-B  
Ceylon, 5-387-B  
Colombia, 5-518-E  
Czechoslovakia, 6-290-A  
Denmark, 6-416-B  
Ecuador, 5-518-F  
effect of ocean currents, 1-223

**Temperature**—*continued*

effect on plants, 2-194

flowering time, 2-222

germination of seeds, 2-217

effective, 2-257

England and Wales, 6-108-B

expansion and contraction due to changes in,  
1-†476-83

heat caused by molecular movement, 1-†379-  
82

Helsingfors, Finland, 6-464-B

human body, 1-393; 2-348

Hungary, 6-290-B

India, 5-387-A

Indo-China, 5-430-B

kite used in determining, 14-500

Kovno, Lithuania, 6-464-B

London, 6-108-B

lowest, 1-210

mammals, 2-15

Manila, Philippine Islands, 5-570

Maracaibo, Venezuela, 5-518-E

measurement, 1-†207-8, \*274, 276, †388-93  
use of sounding balloons, 1-\*259

Mexico, 7-87-B

Morocco, 5-473-C

New Zealand, 5-541-B

ocean depths, 1-66

Panama, 7-48-B

Persia, 5-106

Porto Rico, 7-60

planets, 1-147, 148, 150, 154, 159

plants affected by, 2-\*221, \*223, \*224

Rio de Janeiro, 5-518-F

Roumania, 6-368-A

Santiago, Chile, 5-518-II

Siam, 5-430-A

Singapore, Straits Settlements, 5-430-A

Sofia, Bulgaria, 6-368-A

Tokyo, Japan, 5-364-B

United States, *see subhead* climate under  
*names of various states*

Uruguay, 5-518-G

variations in, below surface of earth, 1-†32

Verkoyansk, Siberia, 6-443-A

winds caused by changes of, 1-227

Yugoslavia, 6-290-A

*see also* Climate; Heat

**Tempering of bronze**, 12-13**"Tempest, The"**

comedy by William Shakespeare, quotation  
from, 7-51

overture by Sir Arthur Sullivan, 12-320

**Temple, Sir William**, 13-178, 179**Temple music**, Hebrew, 12-204**Temple of Diana at Ephesus**, 5-185, \*186**Temple of Love**, Versailles, 11-\*489**Temple of Solomon**, 5-123, 125**Temple of the Enlightenment**, India, 11-\*453**Temple of the Happy Year**, Peiping, China,  
5-\*322**Temple Square**, Salt Lake City, 8-389

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Temples**

- Babylonian, 5-\*86
- Buddhist, 11-\*453
- Egyptian, 5-\*61, 63, \*66, 68, 69; 11-†411, 412, of Ramses the Great, 11-400
  - wall paintings, 12-176
- Greek, 11-†417-25
  - pediment, 11-†40
  - see also* Parthenon; *and under names of gods and goddesses, as* Apollo; Athena
- in caves, 11-400
- Mayan, 7-90, 92
- Mexican, 7-68, \*69, 72
- Mormon, 8-389
- rock temples, India, carvings, 12-102
- Roman, 11-†430-32, 62; 5-\*221, 228, \*231
- Solomon, at Jerusalem, 5-123, \*125
  - looted by Antiochus IV, 5-129
- Temple of the Happy Year, Peiping, 5-\*322
  - use in ancient religions, 11-441
  - see also under names, as* Angkor; Delphi
- Tenite, plastic, color plates, 10-\*542, \*543
- Ten pins, *see* Bowling
- Ten Thousand, Retreat of the, 5-177
- Tenant system of farming, 7-459; 8-203
  - see also* Serfdom
- "Tendencies in Modern American Poetry," by Amy Lowell, 13-349
- "Tender Husband, The," by Richard Steele, 13-180
- Tendon, muscle, 2-328
  - of leg, 2-\*331
- Tendon of Achilles, 2-329, \*331
- Tendrill climbers, plants, 2-†154-55
- Tenebrists, school of painting, 11-247, 249
- Tenerife, island, Atlantic Ocean, 6-491
  - map, 6-591
- Tengri Khan, Tien Shan Mountains, height, 5-336-B
- Teniers, David, painting, "An Old Lady Peeling a Pear," 11-\*265
- Tennessee, state, U. S., description and history, main article, 8-†366-72; general data, 8-373-374-A
  - agriculture, 8-†369
  - drawbacks, 8-372
  - area, 8-373
  - charities and correction, 8-373
  - cities, towns, list, 8-374-A
    - chief industrial, 8-371
  - climate, 8-373
  - counties, list, 8-374
  - dams, 8-368
  - education, 8-369, 373
  - flag, 8-374
  - history, 8-366, 367-70
    - admitted to Union, 8-369
    - Andrew Jackson's services to, 12-512
    - Civil War, 8-366, 370
    - Houston governor of, 12-515
  - holidays, 8-374
  - Indians, 8-367; 12-514-15

**Tennessee, state, U. S.—continued**

- interesting facts, 8-374
- location, 8-373
  - map, 8-499
  - on United States map, 7-595
- monuments, 7-414
- motto, 8-374
- mountain life, 7-\*223, \*224
- name, 8-374
- nicknames, 8-374
- parks, 8-374
- physical features, 8-373, 366
- political facts, 8-373
- products and industries, 8-371, \*372
  - lumbering, 8-†370, 371
- rivers, 8-373, 367
- slavery, 8-370
- state bird, 8-374
- state flower, 8-374
- state song, 8-374
- transportation, 8-369
- "Tennessee," ship, in Battle of Mobile, 7-264
- Tennessee, University of, 8-367, 369
  - Liberal Arts Building, 8-\*367
- Tennessee River, U. S., 8-373
  - Alabama, 8-2
  - Mississippi, 8-206
  - name, 8-374
  - Tennessee, 8-367
- Tennessee Valley Authority, public works program, 8-†368, 371-72; 7-470
  - Wilson Dam, 7-\*499
- "Tennessee's Partner," by Bret Harte, 13-334
- Tenniel, John, cartoon by, 6-\*233
- Tennis, game, main article, 14-†464-70
  - cup matches, 14-470
  - famous matches, 14-467, 470
  - origin of scoring, 14-467
- Tennis Court Oath of Estates General, 6-†187, 190
- Tennis racket
  - grips, 14-466, \*467
  - strokes, 14-\*468-69, 470
- Tennyson, Alfred, Lord, life and works, main article, 13-†249-51
  - "Idylls of the King," 14-378
  - portrait, 13-\*250
  - quotation; compared with Frost in scanning, 13-348
- Tennyson, Charles, 13-250
- Tenochtitlan, Mexico, Aztec capital, 7-71; 13-468
  - captured by Cortes, 13-470
- Tenrec, anteater, 4-\*457
- Tensas or Tensaw River, Alabama, 8-3
- "Tent, The," meteorite, 1-†166
- Tent caterpillars, 3-\*367, \*372; 4-76
- Tentacles
  - coral polyp, 1-56
  - cuttlefish, 3-\*170
  - hydroid, 3-105
  - jettyfish, 3-111
  - marine worm, 3-123

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Tentacles**—*continued*

- moss animals, 3-115
- octopus, 3-167, \*168
- sea anemone, color plate, 3-\*94
- sea cucumbers, 3-138
- squid, 3-170
- Tents**, kinds, and how to put them up, 14-†556 59
  - Mongols, 5-\*436, 437
  - pagoda developed from, 11-\*394, 400
  - primitive dwellings, 11-†396, \*397, \*400
  - skin, of Eskimos, 6-484
  - ting developed from, 11-\*394, 401
- "Tenure of Kings and Magistrates, The,"** by Milton, 13-168
- Tenure of Office Act**, 12-456-1)
- Teotihuacan**, Mexico, pyramids, 7-\*68, \*69, 72
- Tepanecs**, people, Mexico, 7-71
- Tepee**, Indian dwelling, 7-99, \*100, 14-\*557
  - distinguished from wigwam, 8-360
- Terbium**, element, symbol, atomic no. and wt., 1-\*551
- Terburg, Gerard**, paintings by, 11-†267
  - "The Letter," painting by, 11-\*267
- Terebella**, worm, 3-122
- Teredo** (shipworm), 3-155
- Terence**, Roman dramatist, 12-325
- Terentia**, wife, of Cicero, 13-47
- Tereus**, mythological character, 14-453
- Terminal bud**, of plant, 2-\*48, 132
- Terminal moraine**, in physiography, 8-439
- Termites** (white ants), 3-†374-78
  - eaten by aard-vark, 4-457
  - nests, 3-†374 fol.
  - social life, 3-376
  - teakwood proof against, 9-258
- Tern Islands Bird Refuge**, Louisiana, 8-146-A
- Terns**, birds, 4-\*100, 203, \*207
- Terpsichore**, muse, 14-412; 12-\*205
- Terra cotta**, 9-379
  - "della Robbia" colored glazes, 11-130, \*131
  - Tanagra figurines, 12-53
- "Terra Nova,"** Robert Scott's ship, 13-\*506
- Terraced pyramid**, 5-54
- Terrapins**, 3-465, 466, †473-75, \*479
  - shell, 3-†475
- Terre Haute, Ind.**, industries, 8-114
- Terriers**, dogs, 4-\*493 fol., 503
- Terrific rattlesnake**, 3-\*492
- Territory South of the Ohio**, early name for Tennessee, 8-374
- Terror, reign of**, in France, 6-\*189, \*190, 193, 194
  - effect upon England's opinion, 6-87
- Tertiary period**, 3-†46-57; 1-40
  - formation of Bad Lands during period, 8-360
  - forms of life in, table, 3-64
- "Tess of the D'Urbervilles,"** by Thomas Hardy, 13-264
- Tesserae**, mosaic pieces, 12-115
- Test**, shell, 3-78-80
  - sea urchin, 3-136, 137
- Testudo**, Roman war shelter, 10-\*357

- Tetanus**, disease, 2-14
- Tethys Sea**, lost ocean, 3-35; 5-432
- Teton Range**, mountains in Wyoming, 8-454
- Teton River**, Montana, 8-220
- Tetryl**, explosive, 10-417
- Tetzel, Johann**, sale of indulgences by, 13-543
- Teutonic Knights**, 6-446, 462
  - defeat by Vytautas, 6-461
  - in Poland and Lithuania, 6-446 fol.
- Teutonic tribes**, *see* Germanic tribes
- "Texas,"** word, meaning, 8-386-A
- Texas**, state, U. S., **description and history**,
  - main article, 8-†376-85; data, 8-386-87
  - agriculture, 8-381
  - area, 8-386
  - capital and capitol building, 8-376
  - charities and correction, 8-386
  - cities, towns, list, 8-386-B
  - chief industrial, 8-\*378, 385
  - climate, 8-386, 377
    - frosts, 1-206
  - counties, list, 8-386-A
  - education, 8-385
    - institutions of higher learning, list, 8-386
  - exports, 8-385
  - flag, 8-380
  - history, 8-377-81; 12-516
    - Alamo, 8-380
    - American settlements, 7-232
    - Battle of San Jacinto, 12-516
    - Civil War, 8-381; 12-516
    - problem of annexation, 7-235
  - holidays, 8-386 A
  - Indians, 8-381; 7-93, \*103
    - reservations, 8-386-A
  - location, 8-386
  - map, 8-549; 7-594
  - motto, 8-386-A
  - name, 8-386-A
  - nicknames, 8-386-A
  - parks, 8-386-A
  - physical features, 8-376-77, 386
  - political facts, 8-386 A
  - ports, 8-386
  - products and industries, 8-381-85
    - mineral products, 8-383-85
  - rivers, 8-386
  - sand storm, 1-\*228
  - slavery, 8-380
  - state bird, 8-386-A
  - state flower, 8-386-A
  - state song, 8-386-A
- "Texas,"** battleship, 7-\*380
- "Texas, Our Texas,"** song, 8-386-A
- Texas, Province of**, name of Texas when present state belonged to Mexico, 8-379
- Texas, University of**, Administration and Library Building, 8-\*377
- Texas Centennial**, exposition, 8-385
- Texas Independence Day**, 8-386-A
- "Texas Province,"** 8-386-A
- Texas Rangers**, 8-381

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Texas rattlesnake**, 3-<sup>\*</sup>492  
**Texas swift**, lizard, 3-<sup>\*</sup>457  
**Texier, Lily**, wife of Claude Debussy, 12-318  
**Textile industry and arts**  
 chemistry's contribution to industry, 10-546  
 United States, 7-343-F  
 Massachusetts, 8-172  
 New Hampshire, 8-239  
 New Jersey, 8-247  
 North Carolina, 8-294  
 Rhode Island, 8-345  
 Virginia, 8-415  
*see also* Spinning; Weaving, and also names of textile products, as Lace; Rayon; Rugs; Tapestry  
**Textile schools**, U. S.  
 first in U. S., 8-356  
*for textile schools of states see under names of states* subhead education, institutions of higher learning  
**Tezcatlipoca**, Aztec god, 7-91  
**Tezcuco**, Mexico, Indian capital, 7-70  
**Tezcuco, Lake**, Mexico, Aztec settlement on, 7-71, 76  
**Thackeray, William Makepeace**, life and works, main article, 13-†240-41  
 portrait, 13-<sup>\*</sup>241  
**Thailand**, *see* Siam  
**"Thalaba, the Destroyer,"** by Southey, 13-220  
**Thales of Miletus**, Greek philosopher  
 eclipse predicted, 5-160  
 philosophy and discoveries, 13-†2  
 study of electricity, 1-494  
**Thalia**, muse of comedy, 14-412; 12-<sup>\*</sup>205  
**Thalia**, one of three Graces, 14-411  
**Thallium**, element, symbol, atomic no. and wt., 1-<sup>\*</sup>551  
**Thames River**, Conn., 8-62  
**Thames River**, England, 10-253  
 boat racing, 14-†531 fol.  
 cockles found in, 3-153  
 length, 10-253  
 map, 6-573  
 weight of sediment carried, 1-49  
**"Thanatopsis,"** by William Cullen Bryant, 13-297, 298  
 and use of "Oregon," 8-332  
**Thanatos**, death angel, 14-454  
**Thanksgiving Day**, observance, 14-<sup>\*</sup>587, †588  
**Thatch**, grass, for camper's lean-to, 14-557  
**Thatched dwellings**, *see* Shelter, thatched  
**Thayer, Abbott H.**, painting; style, 11-<sup>\*</sup>372  
 "The Virgin," painting by, 11-<sup>\*</sup>372  
**"Theaetetus,"** by Plato, 13-7  
**Theater and drama**, main article, 12-†324-34  
 first moving picture theaters, 10-506  
 Greek, 5-†159; 12-325  
 in Sicily, 6-<sup>\*</sup>473  
 refrigeration in, 1-409; 10-519  
 Roman, 11-432  
 Spanish, 13-78  
**Theater and drama—continued**  
 television, 10-<sup>\*</sup>126  
*see also* Drama  
**Theater of Dionysus**, 5-<sup>\*</sup>159  
**"Theatre Arts,"** magazine, 13-354  
**Theatre Libre**, Paris, 12-333  
**Theban kings**, reign of, in Egypt, 5-59-64  
**Thebes**, ancient city, Egypt  
 restoration, 11-19  
 temple, 5-63  
**Thebes**, ancient city, Greece  
 capital of Boeotia, 5-153  
 captives of, before Alexander the Great, 12-<sup>\*</sup>347  
 destruction, 12-348  
 founded, 14-450  
 revolt against Sparta, 5-175  
**Theine**, in tea, 9-138  
**"Their Wedding Journey,"** by William Dean Howells, 13-332  
**Theiss River**, *see* Tisa  
**Theme**, musical, 12-235-36  
**Themistocles**, Greek general and statesman, life, main article, 12-†338-39  
 builds wall of Athens, 5-166  
 ostracism of, 5-166  
 portrait bust, 12-<sup>\*</sup>339  
 war against Persians, 5-163, 164  
 Battle of Salamis, 13-44  
**Theocracy** established by Calvin, 13-548  
**Theocritus**, Greek poet, 9-79  
**Theodolite**, observation instrument, 1-<sup>\*</sup>278  
**Theodora**, Byzantine empress, 5-405  
**Theodore, Saint**, Gothic statue of, 11-†93-94  
 patron of chivalry, 11-94, 97  
**Theodore**, archbishop, sarcophagus, 11-<sup>\*</sup>76  
**Theodoric**, king of East Goths, reign, 6-293  
 in Ravenna, 11-81  
 treatment of Boethius, 13-58  
**Theodorus**, Greek craftsman, first iron casting done by, 12-3  
**Theodosius II**, Roman emperor, persecution of Jews, 5-134  
**Theophrastus**, plants studied by, 2-2  
**"Theory,"** meaning of word, 1-4  
**"Theory of Moral Sentiment, A,"** by Adam Smith, 13-20  
**Theotocopuli, Dominico**, *see* Greco, El  
**"There is a fountain filled with blood,"** by William Cowper, 13-213  
**"There Was an Old Woman,"** nursery rhyme, text, color plate, 14-174-J  
**Theresa**, countess of Portugal, 6-338  
**Theriodonts**, prehistoric reptiles, 3-34  
**Thermal Unit, British**, 1-407  
**Thermocouple**, location in Diesel engine, 10-<sup>\*</sup>276; use in astronomy, 1-188  
**Thermodynamics**, Kelvin's discoveries, 13-392  
**Thermograph**, self-recording thermometer, 1-<sup>\*</sup>274, 276, <sup>\*</sup>393  
**Thermometer**, main article, 1-†389-93  
 invention and uses, 1-†207-8

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Thermometer—continued****kinds**, 1-†389-93

air, 1-†389, †390, 391

alcohol, 1-390

centigrade, 1-†392

Fahrenheit, 1-†392

hydrogen, 1-391

kerosene, 1-482

medical, 1-391

mercury, 1-482

metallic, 1-391

minimum, 1-392

oven, 1-391

self-recording, 1-391, \*393

water, 1-†389, 390

Diesel engine, 10-†291

wet-and-dry-bulb, 1-393

Weather Bureau's, 1-†274, \*276

**Thermoplastic**, 10-552**Thermopylae**, Spartan defense of, 5-†163, 164**Thermos bottle**, principles of, 1-400**Thermosetting**, 10-552**Thermostats**, 1-†477, \*480; 10-385**Thermorphs**, animals, in Permian period, 3-34**Theseus**, mythological hero, 14-447-48

meeting of Ariadne and Theseus, 5-†143

Minotaur myth; explanation for, 5-16, 143

remains brought back to Athens, 13-35

war with Amazons, 14-425

**Theseus, Duke**, in "Canterbury Tales," 14-335-36**"Thespian,"** meaning, 12-324**Thespis**, part played in developing Greek drama, 12-324**Thessaly**, dist. of Greece, on map, 5-†150**Thetis**, nymph, represented on Portland vase, 12-†29**"They Lived,"** story by Leonid Andreyev, 13-97**"They Knew What They Wanted,"** drama by Sidney Howard, 13-354**Thian Shan Mountains**, *see* Tien Shan**Thibault, Jacques Anatole**, *see* France, Anatole**Thiers, Louis Adolphe**, president of France, 6-200**Thimmonier, Barthélemy**, invents sewing machine, 10-443, \*444**Thing**, Icelandic council, preceding the Althing, 6-419**Things to do**, *see* Contents Volume 14 inclusive pages

fortune telling, 14-†152

indoor games, 14-149-64

adverb game, 14-156

anagrams, 14-162

apple contest, 14-159

apple race, 14-157

battledore and shuttlecock, 14-153

bird, beast, or fish, 14-154

blindman's dinner, 14-160

bubbles, 14-161

"button, button," 14-157

**Things to do, indoor games—continued**

buzz, 14-155

card game, 14-164

card-throwing game, 14-157

Christmas candle, 14-151

cobweb tangle, 14-160

coffepot, 14-163

continued story, the, 14-163

cracker race, 14-159

dog of many parts, 14-156

drawing a pig, 14-157

drinking contest, 14-151

ducking for apples, 14-160

duncecap game, 14-157

empty, 14-161

feather game, 14-157

fortune telling, 14-152

fruit basket, 14-155

fun with bean bags, 14-158

ghosts, 14-150

going to Jerusalem, 14-155

Grand Mufti, 14-155

guessing contest, 14-158

guessing rhymes, 14-163

horse race, 14-160

hunting animals, 14-151

"I pack my trunk," 14-156

indoor tug of war, 14-159

jokesmith's game, 14-151

living alphabet, 14-158

magic ring, the, 14-162

memory game, 14-155

merchant, 14-164

milady's gown, 14-151

modernistic art, 14-150

my aunt is back from Paris, 14-161

my ship is in, 14-164

observation, 14-164

passing the cards, 14-160

passing the penny, 14-154

peanut hunt, 14-158

peanut rolling, 14-160

peanut-shelling race, 14-160

perilous ring, 14-158

playing store, 14-162

poets, 14-163

poor pussy, 14-159

prince of Paris, 14-153

progressive art, 14-164

pussy wants a corner, 14-161

silhouettes, 14-156

Simon says, 14-151

smelling contest, 14-162

solemnity, 14-157

storekeeper, 14-162

tail and the donkey, 14-155

telegrams, 14-159

threading contest, 14-159

tic-tack-toe, 14-154

up, Jenkins, 14-150

we have a secret, 14-154

what did I see, 14-161

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Things to do, indoor games—continued**

- where is my nose, 14-159
- who is it, 14-164
- who stole my horse, 14-154
- word hunt, 14-162
- yard dash, 14-159
- magic, 14-†123-28
- outdoor games, 14-165-74
  - Adam and Eve, 14-169
  - barley break, 14-173
  - bean toss, 14-170
  - belles of fairyland, 14-169
  - blindman's battle, 14-170
  - blindman's buff, 14-174
  - Caesar commands, 14-168
  - Chinese tag, 14-172
  - cross tag, 14-172
  - duck on a rock, 14-167
  - follow my leader, 14-174
  - fox and geese, 14-174
  - hop scotch, 14-170
  - hop sticks, 14-166
  - "Jolly, Old Miller, The," 14-171
  - lame goose, 14-174
  - living statues, 14-169
  - London Bridge, 14-172
  - mimic tag, 14-172
  - moon tag, 14-167
  - obstacle race, 14-168
  - potato race, 14-168
  - prisoner's base, 14-166
  - run, sheep, run, 14-173
  - serious ducks, 14-169
  - shadow tag, 14-172
  - sheep and wolf, 14-170
  - slap jack, 14-174
  - stool ball, 14-171
  - three deep, 14-166
  - tipcat, 14-167
  - tug of war, 14-174
  - wheelbarrow race, 14-168
  - Witch of Endor, 14-171
  - wood tag, 14-172
- puzzles, 14-†96-116; answers, 14-117-12
- riddles, 14-†90-93; answers, 14-94
- selling homemade candy, 14-†87
- tricks, 14-†136-42
  - with cards, 14-†130-34

*see also* Sports and games; Nature study

**Things to make** *see* Contents Volume 14

- ambulance, 14-†38
- aquarium, 14-†2-5
- artificial rose, 14-†54
- automobile, 14-†38
- balloon toys, 14-†7
- batiked glass, 14-†55
- bean gun, 14-†35
- beverages, 14-88
- bird houses, 14-†40-41; 4-†124
- boat and lighthouse models, 14-†34
- boomerang, 14-†39

**Things to make—continued**

- bow and arrow, 14-†39, †49
- candy, 14-83-86
- cannon, 14-†38
- cardboard house, 14-†10
- carpenter's joints, 14-†27
- cart, 14-†38
- Christmas tree support, 14-†38
- clothes hanger, 14-†53
- colored window of cellophane, 12-73
- compass, 10-455
- corner shelf, 14-†50
- desk and bench set, 14-†50
- dog kennel, 14-†42
- doll furniture, 14-†31
- drawing and mounting animals for a zoo, 14-†59-69
- Dutch dolls, 14-†11
- Dutch jumper, 14-†33
- eggs filled with maple sugar, 9-123
- eggshell igloos, 14-†13
- express wagon, 14-†45
- flower-pot holder, 14-†50
- flying propeller, 14-†39
- garden bench, 14-†50
- gliders, 14-†47
- gymnasium, 14-†46
- hanging basket, 14-†50
- hockey stick, 14-†33
- ice boat, 14-†32
- lamp shade, 14-†53
- locomotive, 14-†36
- magazine rack, 14-†50
- marionette show, 14-†70
- miniature animals, 14-†7, †13, †14
- needlecraft
  - braided rug, 14-†77
  - crocheting, 14-†80
  - embroidery, 14-†72
  - first lesson in sewing, 14-†72
  - hooked rug, 14-†79
  - knitting, 14-†81
  - monograms, 14-†75
  - quilt, 14-†78
  - samplers, color plate, 14-†76
  - tea set in appliqué work, 14-†73
- passe-partout frame, 14-†52
- peanut man, 14-†13
- pirates' den, 14-†6
- pop gun, 14-†32
- pottery, 14-†57
- power house, 14-†37
- sail to aid skating, 14-†44
- seesaw, 14-†42
- shacks, 14-†28, †43, †44
- shadow pictures, 14-†8
- silhouettes, 14-†12
- skatemobile, 14-†44
- skis of barrel stave, 14-†33
- sled, 14-†33
- sling, 14-†44
- snow shovel, 14-†38

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Things to make—continued**

- speed roadster, 14-†38
- stencil, 14-†9
- stilts, 14-†42
- stretcher for injured person, 2-400
- target, 14-†49
- telephone screen, 14-†53
- tie-and-dye work, 14-†56
- tool chest and cabinet, 14-†30
- tops, 14-†42
- toy people, 14-†7
- trench gun, 14-†38
- waste basket, 14-†53
- weather recording instruments, 14-†48
- whistle, 14-†32
- window box, 14-†50
- woodworking tools and how to use them, 14-†22-26
- workbench, 14-†29
- workshop, 14-†28
- "Thinker, The"**
  - painting by Eakins, 11-†356, 360
  - statue by Rodin, 11-†349
- Thinkers**, Greeks the greatest in history, 13-1 fol.; 5-149
- Third (Communist) International**, 6-442
- Third Estate** of French assembly, 6-†187, 188, 190
- "Third of May, The,"** painting by Goya, 11-†306, 309
- Third Republic**, France, 6-200
- Third Symphony of Beethoven**, *see* Eroica Symphony
- Thirst**, caused by salt, 9-413
- Thirteen colonies**, list, 7-173; *see also* American colonial life
- Thirteen-year cicada**, insect, 3-373
- Thirty Years' War**, 6-214, 252
  - causes, 6-214
  - destruction caused by, 6-214, 217
  - Gustavus Adolphus, 6-214, 400; 12-402
  - results; Peace of Westphalia, 6-214
    - Austria, 6-263
    - Denmark, 6-414
    - France, 6-181
    - Germany, 6-181, 214
    - Sweden, 6-401
    - Switzerland, 6-252
  - Richelieu's part in, 6-181
  - Sweden's entry into, 6-400; 12-402
- "This Little Pig Went to Market,"** nursery rhyme, text, color plate, 14-†174-II
- Thisbe and Pyramus**, mythological characters, 14-†438
- Thistle**, flower, 2-†174
- Thistle**, Russian, seeds, 2-212
- "Thistle and the Rose, The,"** poem by William Dunbar, 6-119
- Thistle butterfly**, 3-282, \*283
  - color plate, 3-†278
- Tholepins**, of a boat, 14-531

- Thomas, Saint**, the doubting disciple, in India, 5-372
  - statue, 9-†7
- Thomas, Augustus**, playwright, 13-354
- Thomas, George Henry** (the Rock of Chickamanga), 7-264
- Thomas, Gertrude**, words to Minnesota song, 8-198-A
- Thomas, Norman**, presidential candidate, 7-341
- Thomas, Percy Holbrook**, builds mechanical fire-watchman, 1-†415
- Thomas, Seth**, 8-56
- Thomas, William**, buys rights in Howe's sewing machine, 10-444
- Thomas Aquinas, Saint**, *see* Aquinas, Thomas, Saint
- Thomas the Rhymer**, prophecy by, 6-113
- Thompson, David**, Canadian geographer, explorer, and fur trader, in Montana region, 8-217
- Thomson, Sir J. J.**, and electron theory, 1-284
- Thomson, Tom**, Canadian artist, **biography**, 13-582; leader of "Group of Seven," 7-29-H
- "Spring Ice,"** color plate, 7-†29-I
- Thomson, Sir William**, *see* Kelvin, William Thomson, baron
- Thomson compass**, 13-392
- Thor**, god, 6-370, 377
- Thorarensen, Bjarni**, 6-420
- Thorax**, *see* Chest
- Thoreau, Henry David**, **life**, main article, 13-†310-11; and Hawthorne, 13-300
- Thorium**, element, symbol, atomic no. and wt., 1-†551, 558-G
- Thorn apple**, 2-†204
- Thornhill, Sir James**, English painter, 11-296
- Thornhill, Jane**, 11-296
- Thorns**, protection to plant, 2-†205
- Thorny devil**, lizard, 3-450
- Thorny locust**, stipules, 2-24
- Thorny oyster**, 3-160
- Thornycroft, Sir William**, statue by, 2-†213
- Thorvald Nilson, Mt.**, Antarctica, elevation, table, 1-25
- Thorvaldsen, Albert Bertel**
  - art of, 11-327
  - "Lion of Lucerne," 6-†250
- Thothmes**, kings of Egypt, *see* Thutmose
- Thought**, effect upon breathing, 2-340
- "Thoughts,"** by Blaise Pascal, 13-109
- "Thousand and One Nights"** ("Arabian Nights' Entertainment"), **retold**, 14-†361-76; 5-398
- Thousand Islands**, St. Lawrence River, 8-283
- Thrace**, Greece, agriculture, 6-368-B
- Thrashers**, birds, 4-†55, 134
- Thread**
  - linen, 9-48
  - rayon, 9-†85, 86
  - rope making, 9-288
  - silk, 9-42, †43
  - spinning of, 10-†339-42
- Threading contest**, game, 14-159

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Three Arch Rocks Bird Refuge**, 8-332  
**Three-banded armadillo**, 4-†455  
**"Three Bears, Goldilocks and the,"** fairy tale, text, 14-225-26  
**"Three Bears, The,"** by Robert Southey, 13-220  
**"Three Blind Mice,"** nursery rhyme, text, color plate, 14-174-K  
**Three-cushion game**, billiards, 14-481  
**Three deep**, game, 14-166  
**Three F's**, Irish reform movement, 6-160  
**"Three Fates,"** Parthenon sculpture, 11-\*44  
**Three Graces**, 14-311  
**"Three Marys at the Tomb, The,"** painting by Hubert van Eyck, 11-195  
**"Three Musketeers, The,"** by Alexandre Dumas, 13-128, †129; 14-512  
**"Three Nephews, or The Uncle from Boston, The,"** opera by Mendelssohn, 12-286  
**"Three Sisters, The,"** play, by Anton Chekhov, 13-96  
**"Three Soldiers,"** by John Dos Passos, 13-355  
**Three Teachings**, Oriental religions, 13-514  
**Three unities**, in classic form of drama, 12-330  
**Three Wise Men**, *see* Wise Men, Three  
**"Three Wise Men of Gotham,"** nursery rhyme, text, color plate, 14-174-I  
**Thresher**, shark, 3-197, 198  
**Threshing machinery**, 6-\*361; 9-\*118; 10-\*531  
   primitive, 7-†452  
**Throat**  
   muscles, 2-340, color plate, \*326  
   sensitiveness of skin, 2-292  
**Thrombin of blood**, 2-348  
**Thrombogen of blood**, 2-348  
**Throne chairs**, 12-178, †181, 182, 185  
**Thronos**, chair, 12-178  
**"Throstlebeard, King,"** fairy tale, text, 14-†192-94  
   color plate, 14-\*192  
**Throttle**, gas, 10-\*283  
**"Through the Looking-Glass"**  
   opera by Deems Taylor, 12-257  
   story by Lewis Carroll, 13-267  
**Throwing**, sport, 14-\*475, 476  
**Thrush**, golden (flicker), 4-\*71  
**Thrush**, water, 4-47  
**Thrush blackbird**, 4-46  
**Thrush family**, 4-18, \*171  
   *see also* Bluebird; Nightingale; Robin  
**Thrushes**, birds, 4-†52-55  
   British, 4-171  
   color plates, 4-\*24, \*88  
   *see also varieties of thrushes, as* Wood thrush, *etc.*  
**Thrush's anvil**, 4-171  
**Thrust**, in arch, 11-428  
**Thrust**, in fencing, 14-\*513, 514  
**Thryothorus ludocivianus**, bird, 8-356-A  
**Thucydides**, Greek historian, 12-343  
**Thule**, 13-494  
**Thulium**, element, symbol, atomic no. and wt., 1-\*551  
**"Thumb, Gen. Tom"** (Charles Stratton), midget, 12-577  
**Thumb sucking**, effect upon teeth, 2-311, 312  
**"Thumbelina,"** by Hans Christian Andersen, 13-86  
**Thunder**, 1-247  
**Thunder pumper** (bittern), bird, 4-103  
**Thunderbolts of Jupiter**, 1-75  
**Thunderer, the** (Jupiter), 14-407  
**Thunderheads**, clouds, 1-236, 246  
**Thunderstorms**, 1-†246, †247-49  
**Thüringerwald**, forest, Germany, 6-241-B  
   map, 6-582, D3  
**Thuringia**, state, Germany, map, 6-582  
**Thurn, Count of**, courier service, 10-86  
**Thursday**, origin of name, 10-483; 6-377  
**"Thus Spake Zarathustra,"** by Richard Strauss, 12-316  
**Thusnelda**, German heroine, 6-\*204  
**Thutmose I**, king of Egypt, 5-62  
   dynasty and empire of, 11-14  
**Thutmose II**, king of Egypt, 5-62  
**Thutmose III**, king of Egypt, empire, 5-67  
   conquests, 5-63  
   obelisks by, 5-\*63  
   portrait relief, 11-\*19  
**Thwarts**, of a boat, 14-531  
**Thyme**, herb, 9-209, 311  
**Thyri**, queen of Denmark, 6-409  
**Thyroid gland**, 2-324, \*335; 1-558-II  
**"Thyrsis,"** by Benedict Arnold, 13-256  
**Tian Shan Mountains**, *see* Tien Shan  
**Tiber River**, in Central Italy, 10-253  
   length, 10-253  
   map, 6-588  
   sculpture of Father Tiber, 5-208  
**Tiberius**, Roman emperor, reign, 5-232  
   arch in Antioch, 5-6  
   builds villas in Capri, 6-476  
   hated, 5-236  
   Square of, Antioch, 5-†3, 6  
**"Tiberius, Ship of,"** Roman houseboat, 5-\*232  
**Tiberius, Square of**, Antioch, 5-†3, 6  
**Tibesti**, mountainous region, Africa, 5-453  
**Tibet**, division, China, description and history, 5-432, †438-41  
   animal life  
     bears, 4-318  
     birds; pheasants, 4-187, \*189  
     pandas, 4-\*322  
     takins, 4-430  
   carved mask from, 12-\*98  
   climate, 5-336-C  
   limestone rock, 3-51  
   map, 5-590  
**Tibet, Plateau of**, 5-336-B  
**Tibetans**, people, life and customs, 5-439; *see also* Tibet  
**Tibial nerves**, 2-\*393, \*396  
**Tic-tack-toe**, game, 14-154  
**Tick**, animalcule, 3-406, 413  
   enlarged under microscope, 10-\*487

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Tick trefoil**, seed pod, 2-\*211  
**Ticker tape**, 10-\*96, 99  
**Tickers**, machines, 7-583, \*584; 10-\*96  
 invention of, 13-443  
**Ticonderoga, Fort**, New York  
 capture, 12-†495; 8-401  
 disappearance of sentries, 12-494  
 ruins, 7-\*412  
**Tidal theory** of solar system, 1-†7  
**Tidal waves**, caused by earthquakes, 1-80  
**Tide-rock fly**, 3-363  
**Tides**  
 caused by moon, 1-133, \*135, \*137  
 effect upon earth's rotation, 1-9, 135  
 effect of sun upon, 1-134  
 efforts to harness power of, 9-442  
 height, 1-134  
 Hudson River, 8-283  
 Liverpool, England, 10-246  
**Tide-water Maryland**, 8-162  
**Tide-water Virginia**, 8-410, 418  
 climate, 8-418  
**Tie-and-dye work**, 14-†56  
**Tien Shan Mountains** (Mountains of Heaven),  
 1-29; 5-336-B  
 jade from, 5-437  
**Tientsin**, China, 10 263  
 map, 5-591, N5  
**Tiepolo, Giovanni Battista**, 11-307  
**Tierra del Fuego**, islands, So. Amer.  
 discovery name, 13-504  
 map, 5-604  
**Tiffany, Louis C.**, stained glass by, 12-\*70, 77  
**Tiffany vase**, 12-\*90  
**Tiflis, U.S.S.R.**, 6-368, 12-449-E  
**Tiger beetle**, insect, 3-\*334, 335  
**Tiger bittern**, bird, 4-109  
**Tiger cat (brown tabby)**, 4-488  
**Tiger cats**, 4-†294  
 Australian pouched, 4-463  
 love of catnip, 2-175  
**Tiger lily**, 2-\*146  
**Tiger moth**  
 caterpillar of, 3-\*291  
 life cycle, 3-\*270  
**Tiger of France** (Georges Clemenceau), 6-201  
**Tiger swallowtail butterfly**, 3-277, \*279  
**Tigers**, 4-287, \*289, †290  
 prehistoric, 3-54, \*55  
**Tigris River**, in Western Asia, flowing into  
 Persian Gulf  
 Assyrians live along banks, 5-88  
 irrigation, 10-529  
 length, 10-253  
 maps, 5-†76, 580  
 transportation on, 10-137, 263  
 water craft, 5-\*94  
**Tilden, Samuel J.**, in election of 1876, 7-274  
**Tilefish**, 9-368  
**Tiles**, how made, 9-379  
 arabesque, 12-56  
 from Darius' palace at Susa, 11-\*27, 28  
**Tiles**—*continued*  
 Mesopotamian, 11-24, \*27, 28; 12-55  
 used in building, 9-379  
**"Till Eulenspiegel's Merry Pranks,"** by Richard  
 Strauss, 12-252  
**Tilly, Johann Tserclaes**, count of  
 at Battle of Breitenfeld, 12-402  
 defeated by Swedes, 6-400  
 in Thirty Years' War, 6-214  
**Tilsit, Germany**, bridge, 10-\*211  
**Tilsit, Peace of**, 12-430  
 arranged by Napoleon and Alexander, 6-\*434  
 Prussia's losses, 6-224  
**Tilting chest**, 12-184  
**Tilton, N. H.**, residence of Mary Baker Eddy,  
 13-557  
**Timber**, *see* Lumber and lumbering; Wood  
**Timber wolves**, 4-\*298, \*300, 301  
**Timbrel** (tambourine), musical instrument, 12-  
 258-C, †203, \*239  
**Timbuctoo**, French Sudan, Africa, 5-473  
**"Timbuctoo,"** by Alfred Tennyson, 13-250  
**Time**, measuring and recording, 10-\*459-73  
 A.M. and P.M. explained, 10-472  
 and motion, 10-469  
 broadcast by U. S. Naval Observatory, 10-469  
 calendar making, 10-†475-83; *see also* Calendar  
 division into "twelves," 10-460  
 Einstein's theories, 13-409  
 geologic, table, 1-40  
 god of, 1-155  
 International Date Line, 10-†470-72  
 music, 12-215  
 ship, 10-468, 473, 300  
 stars measure, 1-186  
*see also* Clocks  
**Time belts**, division of, 10-†472-73  
**"Time of Man, The,"** novel by E. M. Roberts,  
 13-352  
**"Times, The,"** London newspaper, opinion of  
 Bell's telephone, 10-112  
**"Times, The New York,"** American newspaper,  
 excerpt, 1-386  
**Timor**, island, Malay archipelago, and depend-  
 encies, 5-529-B  
 map, 5-597  
 ownership, 5-522  
**Timor Sea**, arm of Indian Ocean, maps, 5-600,  
 597  
**Timothy grass**, 2-\*178  
 pollination, 2-\*111  
 stem, cross section, 2-\*144  
**Timpanagos Cave National Monument**, Utah,  
 8-396-A  
**Timrod, Henry**, lyric to "South Carolina" com-  
 posed by, 8-356-A  
**Timur**, Mongol conqueror, *see* Tamerlane  
**Tin**, element, 9-419-20  
 bronze contains, 12-12, 14  
 mines, 9-420; 5-426  
 ancient Britain, 6-4; 9-420  
 silk weighted with, 9-43

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Tin—continued**

- sources in ancient times, 12-14  
 symbol, atomir no. and wt., 1-<sup>\*</sup>551
- Tin cans**  
 composition, 9-420  
 how made, 9-229
- Tin foil**, 9-420
- Tin-smelting works**, largest in world, 5-426
- Tinder**, in fire making, 10-332
- Tinder box**, 10-<sup>\*</sup>332
- "Tinder Box, The,"** fairy tale, by Hans Christian Andersen, 13-86; text, 14-†183-85
- T'ings**, Chinese buildings, 11-<sup>\*</sup>394, 401
- Tinicum Island**, Penn., early fort, 8-334
- Tinker**, fish, 3-230
- Tinker Bell**, character in "Peter Pan," 13-267
- "Tintern Abbey,"** by William Wordsworth, 13-215
- Tintoretto** (Jacopo Robusti), 11-184-88  
 aided by daughter Marietta, 11-188  
 and Titian, 11-184  
 St. Mark freeing slave, 11-<sup>\*</sup>182  
 victor in St. Rocco competition, 11-186
- Tintypes**, early photographs, 10-†448
- "Tiny Belle,"** fairy tale, text, 14-†202-4
- Tio Sam, El** (Uncle Sam), 7-47
- Tipcat**, game, 14-167
- Tip-up** (sandpiper), 4-117
- Tippecanoe, Battle of**, 7-210
- "Tippecanoe and Tyler too!"** campaign slogan, 7-228
- Tippecanoe River**, Ind., 8-116
- Tipping**, on trips, 10-294, 304
- Tippoo**, leader in India, 5-383
- Tirana**, capital of Albania, 6-366
- Tires**, automobile, 9-<sup>\*</sup>260, 270  
 chemistry's contributions to, 9-271-B  
 compressed air used in, 1-462  
 cotton in, 9-29  
 good tires important in driving, 2-440
- Tirol**, province, Austria, *see* Tyrol
- Tirrhen**, mythical inventor of chess, 14-488
- Tiryns**, Greece, palace at, paintings, 11-33
- Tisa**, or **Tisza River**, Hungary and Yugoslavia  
 length, 10-253  
 map, 6-586
- Tissue**, anatomy, 2-280, 290
- Titan**, moon of Saturn, 1-123, 156, fol. <sup>\*</sup>152
- "Titanic,"** steamship, sinking of, 1-64; 10-223
- "Titanic, The,"** poem by Pratt, 13-581
- Titanium**, element, symbol, atomic no. and wt., 1-<sup>\*</sup>551; 8-415
- Titans**, gods, 14-421
- Tithonus and Aurora**, mythology, 14-442
- Titian** (Tiziano Vecellio), life and art, 11-†177-80, 185  
 opinion of Correggio's dome at Parma, 11-184  
 paintings  
   "Concert, The," 11-<sup>\*</sup>178  
   "La Bella," 11-<sup>\*</sup>180  
   "Last Supper," 11-<sup>\*</sup>179  
   "Man with the Glove, The," 11-<sup>\*</sup>177

**Titian, paintings—continued**

- portrait of Ariosto, 13-†66  
   "Sacred and Human Love," 11-<sup>\*</sup>179
- Titicaca, Lake**, South America, 5-518-A
- Titmice**, birds, 4-†62-63  
 chickadees, 4-†61-62  
 English, 4-†173  
 nest building and breeding, 4-173  
 use of woodpeckers' nests, 4-68  
*see also varieties of titmice, as* Tufted titmice
- Tito**, premier of Yugoslavia, **biography**, 5-568
- Titus**, Rembrandt's son, 11-277
- Titus, Arch of**, Rome, 11-61, 64, <sup>\*</sup>437  
 carved relief, 11-<sup>\*</sup>68
- Titus, Flavius Sabinus Vespasianus**, emperor of Rome, 5-238, 239  
 siege against Jews, 5-133  
 temple at Jerusalem destroyed by, 15-125
- Titus Flavius Sabinus Vespasianus**, *two emperors of Rome, see* Titus; Vespasian
- Tiu**, god, 6-377
- Tivoli**, Italy, castle, 11-<sup>\*</sup>460
- Tlapallan**, in Mexican mythology, 7-70
- Tlaxcala**, state, Mexico, map, 7-597
- Tlingit Indians**, 7-<sup>\*</sup>106
- Tmolus**, god, judges music of Apollo and Pan, 2-†302
- T.N.T.**, trinitrotoluene, 10-418
- "To a Nightingale,"** by John Keats, 13-231
- "To a Waterfowl,"** by William Cullen Bryant, 13-298
- "To a Wild Rose,"** by Edward MacDowell, 12-257
- "To Autumn,"** by John Keats, 13-232
- "To Be Rather than to Seem,"** quotation from Cicero, 8-296-A
- "To Market, to Market, to Buy a Pig,"** nursery rhyme, text, color plate, 14-†174-F
- "To Mary in Heaven,"** by Robert Burns, 13-210
- Toads**, main article, 3-†415-26  
 compared with frogs, 3-416, 421  
 eggs and hatching, 3-†417-20, †424 26, <sup>\*</sup>222  
 prehistoric, 3-29  
 size, 3-<sup>\*</sup>424, 426  
 skin; molting, 3-416  
 tree frog (tree toad), 3-<sup>\*</sup>68, <sup>\*</sup>418, <sup>\*</sup>420, †423-25
- Toadstools**, 2-<sup>\*</sup>55, †57, <sup>\*</sup>71 fol.
- Tobacco**, main article, 9-†221-24  
 burley, 8-137  
 chief product of Virginia colonists, 7-123  
 early opposition to use, 9-222  
 first brought to Europe, 12-405  
 flavor due to bacteria, 2-20  
 how grown and cured, 9-†222-24  
 introduced into England, 9-222  
 Kentucky's price problem, 8-138  
 manufacture, 9-†224  
   Florida, 8-74  
 quality; grades, 9-†222-24  
 storage of leaves, 8-<sup>\*</sup>413  
 taxed by government, 7-377; 9-224

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Tobacco** -continued

where cultivated, 9-222-23; 5-490

United States, 7-343-E

Connecticut, 8-58

Kentucky, 8-137

North Carolina, 8-287, \*290

Virginia, 8-406, 409, 414

**Tobacco heart**, 9-221**Tobacco State**, nickname for Kentucky, 8-138-B**Tobacco worm**, 3-290**Tobago**, island, West Indies, 7-54-B, 66**Toboggan**, how built, 14-483**Tobogganing**, sport, 14-483**Tocantins River**, South America, 9-203**Todd, Dorothea Payne**, *see* Madison, Dolly**Toddmoei**, on Japanese sword guard, 12-488**Toe joint**, anatomy, 2-320**Toe nail**, *see* Nail**Toes of animals**

bear, 4-312

dromedary, 4-397

giraffe, even-toed animal, 4-403

odd-toed animals, 4-348

one-toed animals, 4-350, 4506-7

ostrich, 4-233

**Toga**, Roman, 9-7, 8, 16**Togo**, territory in Africa, 5-470, 473**Tohunga**, Maori priest, 5-535**"Toilers of the Sea,"** painting by Albert Ryder, 11-374**Toilet articles**, bronze, 12-17**Toilet box**, Egyptian, 12-177**Tokay**, Hungarian wine, 6-287**Tokiwa**, mother of Japanese heroes, 5-349**Tokugawa**, Japanese clan, 5-354**Tokyo**, Japan

becomes capital, 5-356

earthquake, 5-364-B

fire, 10-336; 5-359

location by Lat and Long., 5-364-B

map of city and vicinity, 5-592

rainfall, 5-364-B

temperature, 5-364-B

**Tokyo, Bay of**, Japan, map, 5-592**Toledo**, Ohio

given to Ohio, 8-183

glassworks, 8-311

industries, 8-308, 311; 9-236

rainfall and temperature, 8-312-A

**Toledo**, Spain

El Greco's painting of, 11-244

Goths in, 6-319

**Toleration**, religious, of pagan religions, 5-273**Toleration**, Edict of, Austria, 5-138**Tolstoy, Leo (Lev) Nickolaevich**, count, life and works, main article, 13-490-92  
 portrait, 13-491**Toltecs**, people, power and civilization, 7-468-70**"Tom, Tom, the Piper's Son,"** nursery rhyme, text, color plate, 14-474-B**"Tom Jones,"** by Henry Fielding, 13-188**Tom Sauk Mountain**, peak in Missouri, 8-208**"Tom Sawyer,"** by Mark Twain, 13-328, 4330**"Tom Thumb"** (Charles Stratton), midget, 12-577**"Tom Thumb,"** fairy tale, text, 14-4217-19**"Tom Thumb,"** locomotive, 10-182, 183, 4188**Tomato**, vegetable, 9-150, 4151

Indiana industry, 8-115

plant, grafted on potato plant, 2-262

water content of leaves, 2-259

**Tomato worm**, 3-274, 286, 290**Tombigbee River**, U. S., northeastern Mississippi to Alabama River, 8-2, 3, 8

Mississippi, 8-206

**Tombs**

"beehive," 11-416

catacombs at Rome, 11-75, 440, 441; 5-251, 273; 12-211

**Egyptian**

bread found in, 9-238, 239

decorations and furnishings, 11-410 fol., 409, 412; 12-79, 176

excavation of Tutankhamon's, 5-47 fol., 64

for sacred bulls, 5-67

walk-inscriptions, 10-34, 40

wall paintings, 11-6, 10; 12-26

when and why built, 5-54, 10

*see also* Pyramids

Etruscan, 5 191, 192, 4194

in caves, 11-400

Mausoleum at Halicarnassus, 5-185, 4186

Sumerian, 5-411

Taj Mahal at Agra, India, 11-450; 9-432; 12-114; 5-366, 375

"Unknown Soldier's," 7-270, 4612

**Tombstone**, Ariz., 8-22**"Tommy and Grizel,"** by Barrie, 13-268**Tomtit** (titmouse), bird, 4-62**Tomtom**, drum, 12-202**Ton**, measure, 10-375**Tonale Pass**, Italy, 6-315-A**Tone**, Wolfe, 6-158**Tone poems**, *see* Symphonic poems**Tonga (Friendly) Islands**, Pacific Ocean, description, 5-528, 4529

dwellings, 11-399

map, 5-572

**Tongking**, *see* Tonkin**Tongue**

anteater, 4-450, 451

bird, 4-67, 73

fly, 10-489

human, 2-4307 fol.

cross-section, 2-309, color plate, 4278

snail, 3-259

snake, 3-482

woodpecker, 4-67, 73

**Tongue River**, U. S., 8-220**Tonkin**, Indo-China, 5-429, 430, 430-B**Tonkin**, Gulf of, Asia, map, 5-588**Tonle Sap**, lake, French-Indo-China, 5-430**Tonnage**, of ships, 1-471

yearly; vessels entering chief ports, 10-240

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Tonsil, lifigual**, 2-\*308

**Tonsure**, 13-547

**Tonti, Henri de**

Arkansas, 8-28

Illinois, 8-96

**Tontp National Monument**, Ariz., 8-24-A

**Tool chest and cabinet**, how to make, 14-†30

## Tools

agricultural, 7-452

bronze, 12-13

Egyptian, 5-\*50; 11-8

goldsmithing, 12-80

mechanical principles, 1-325 fol.

Red Paint People's, 8-148

Stone Age, 5-24 fol.; 11-†2-3

## • woodworking

ancient, 12-\*2

how to use

auger, 14-†26

chisel, 14-†25

coping saw, 14-\*26

gauge, 14-†24

hammer, 14-†22

plane, 14-†24, \*26

sandpaper, 14-†26

saw, 14-†23

screw driver, 14-†24

things to be made with

bean gun, 14-†35

bird house, 14-†40, †41

boat models, 14-†34

bow and arrow, 14-†49

corner shelf, 14-†50

desk and bench set, 14-†50

dog kennel, 14-†42

doll furniture, 14-†31

Dutch jumper, 14-†33

express wagon, 14-†45

flower-pot holder, 14-†50

garden bench, 14-†50

hanging basket, 14-†50

hockey stick, 14-†33

ice hoat, 14-†32

joints, how to make, 14-†27

lighthouse model, 14-†34

locomotive, 14-†36

magazine rack, 14-†50

mounted animals, 14-†61

Noah's Ark, 14-†34

pop gun, 14-†32

power house, 14-†37

sail, 14-†44

seesaw, 14-†42

shack, 14-†43

skatemoibile, 14-†44

skis, 14-†33

sled, 14-†33

sling, 14-†44

stilts, 14-†42

tool chest, 14-†30

tops, 14-†42

toys, 14-†38

## Tools, woodworking—continued

tree shack, 14-†44

weather vane, 14-†48

whistle, 14-†32

wind gauge, 14-†48

window box, 14-†50

workbench, 14-†29

workshop, 14-†28

*see also* Weapons

**Tooth brush** and its use, 2-\*311, 316

**"Toothless animals,"** 4-†450-57

**Toothpick State (Arkansas)**, 8-28

**Toothpicks**, people of Arkansas, 8-30-B

**Top shell (Trochus)**, 3-141-43, 149

**Topaz**, precious stone, color plate, 9—frontispiece

**Topeka**, Kansas, 8-126

industries, 8-130

**Topliffe, Samuel**, 10-78

**Tops**, how to make, 14-†42

**Topsoil**, productive, 7-466

**Torches**, cave-dwellers', 10-388

**"Toreador Fresco,"** Greek painting, 11-\*31, 32

**Toreador Song**, from "Carmen," 12-253

## Tories

Canadian political party, 7-17

English political party, 6-72, 95

in American colonies

migration to Canada, 7-13

treatment of, 7-168

**Tornado**, 1-\*229, 230

**Toronto**, Canada, 7-29-Q, 33-A, 33-B

made capital of Upper Canada, 7-14

**Toronto University**, Canada, 7-29-Q, 13-567

**Torpedo bomber**, landing on ship, 7-\*488-B

**Torpedo ray**, fish, 3-198, 201

## Torpedoes

gyroscope used, 1-291

Robert Fulton's experiments with, 10-220

used by submarine, 10-\*309, 368-B

**Torquemada, Tomas de**, and Inquisition, 6-323

**Torres Strait**, Australia, map, 5-601

## Torricelli, Evangelista

air pressure measured by, 1-455, 456

barometer invented by, 1-260, \*261; 13-108

**Torrid zone**, *see* Tropics

**Tortillas**, Mexican cakes, 7-43, 81

**Tortoise**, reptile, main articles, 3-†465-80

age, 3-467

eggs and nesting, 3-472, 478

giant, 3-\*465

hibernation, 3-467

pigmy, 3-\*474

prehistoric, 3-35, \*467

shell of, 3-†465-66, 473, †475, 478

size, 3-468

*see also* Turtles

**Tortoise shell butterfly**, 3-276, 282

**Tortoise shell cat**, 4-488

**Tortugas**, early name for Cayman Islands, 7-55

**Tory**, *see* Tories

**"Tory,"** ship, 5-534

**"Tosca,"** opera by Puccini, 12-253

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Totalitarian state**, 7-554  
 Italy example of, 6-315-B
- Totem poles** of American Indians, 7-\*17, †98, \*105; 8-†11; 12-†96
- Totems**, Indian emblems, 7-†98
- Toucan**, bird, 4-\*11, †194  
 color plate, 4-\*185
- Touch**, sense of  
 in animals, 3-70  
 whiskers of cat, 4-485  
 in skin, 2-291  
 in tongue and hair, 2-292  
 six blind men and the elephant, 2-†295  
 unreliable testing heat and cold, 1-389
- Touch-me-not**, plant (balsam), 2-\*213  
 seed dispersal, 2-214
- Touch system**, in typing, 10-64
- Toulon**, France, blockaded by Nelson, 12-422
- Toulouse-Lautrec Monfa, Henri Marie Raymond de**, paintings by, 11-349
- Tourist expenditures**, classed as imports, 7-513
- Tourmaline**, precious stone, color plate, 9-frontispiece
- Tournai**, Belgium, 6-350
- Tournament of Roses**, 8-43
- Tournaments**, medieval, 5-\*306, 354
- Tournaments of Song**, minnesingers', 12-216
- Tourniquet**, device to stop bleeding, 2-†406
- Tours**, Battle of, 5-292, 423
- Toussaint L'Ouverture, François Dominique**, rule over Haiti, 7-57, 58
- Tov, Baal Shem**, *see* Shem, Israel Baal
- Tower Bridge**, London, 10-\*212
- Tower of Babel**, 11-†406; 10-\*5
- Tower of London**, 6-\*41  
 in Henry VIII's time, 12-\*393  
 menagerie in, 4-476  
 warden, 6-\*86
- Tower of the Winds**, Athens, 10-461
- Towers**  
 at Jamestown, Va., 11-\*498  
 bridge, 10-\*211, \*212, \*213, 214  
 church  
 bell towers, 11-†454, \*455  
 campanile of cathedral at Florence, 11-\*118  
 Gothic spires, 11-\*472, 475  
 lighthouse, 10-†226, †229  
 minarets, 5-\*403, 405  
 radio, 10-\*115  
 siege towers, 10-356, \*357  
 ziggurats, 11-404, \*405  
*see also* Pagodas
- Towhees**, birds, 4-†136  
 feeding, 4-\*125  
 graph of song, 4-\*5  
 winter braved by, 4-124
- Town**, or **township**, government by, 8-171
- Town crier**, 10-\*73
- Town House**, Boston, public library established, 10-556
- Town meetings**, colonial New England, 7-148, \*152
- Towns**  
 county subdivisions; government, 7-386  
 growth of; England, 6-39  
 medieval, 5-†308-11  
 Avila, Spain, 5-\*309  
*see also* Cities
- Townsend-Green, Ida**, lyric to "Connecticut State Song" written by, 8-62
- Townshend Acts**, 8-277
- Toxins**  
 germ-produced, battled by blood, 2-350  
 intestinal waste a cause of, 2-367
- "Toy Symphony,"** by Haydn, 12-276
- Toyabe Mountains**, Nevada, 8-234-A
- Toynbee Hall**, settlement house, 7-440
- Toys**, how to make, *see* Things to make
- Tracery**, in architecture, 11-464, †465-66
- Trachea** (windpipe), anatomy, 2-\*334, \*335, \*352
- "Trachinian Women, The,"** play by Sophocles, 13-36
- Trachis**, in Greek mythology, 4-50
- Track and field sports**, main article, 14-†471-76  
*see also* Sports
- Tracks**, railroad, 10-194  
 expansion in heat: laying of, 1-†478  
 of first railways, 10-194
- Tract**, civil division, Maine, 8-156
- Tractors**  
 army, 10-\*363, 367  
 farm, 7-\*455, \*457; 9-\*98  
 lumber camp's use, 9-\*253, 254; color plate, 7-\*29-J  
 road making with, 10-\*154  
 undersea, 10-\*523, \*525
- Trade**, main article, 7-†565-78  
 Arabian, 5-395  
 art and learning spread by, 5-110-11  
 barter, 7-502  
 buying and selling, 7-†532-49  
 China, 5-330  
 colonial; Virginia with England, 8-408  
 cotton's importance, 9-29  
 differences leading to trade, 7-571, 574  
 docks and harbors, 10-†244 50  
 during Crusades, 5-283; 10-167  
 earliest trading peoples, 10-†161-63  
 Arameans, 5-89  
 Cretans, 5-144 fol.; 10-162  
 Egyptians, 5-144; 10-†161  
 Egyptians and Semitic Akkadians, 5-80  
 Etruscans, 5-194  
 Greeks and Romans, 10-163, 166  
 Jews, 5-127  
 Neolithic peoples, 5-40  
 Phoenicians, 5-112; 10-162  
 quest for tin, 12-14  
 Scandinavians, 6-373  
 Semites and Sumerians, 5-78  
 Far East, 5-395  
 influence on Greek art, 12-52  
 inland waterways; importance to, 10-†252-68  
 international, *see* International trade

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Trade—continued**

- Interstate Commerce Commission, 7-288
- Japan, 5-354, 356, 357, 360
- modern, 7-575
- Machine Age, 7-565 fol.; 10-224
- mass production and consumption, 7-566-67
- meaning of, 7-571
- medieval, 10-167
- Italy, 5-310-11; 6-296, 297
- merchant marine** (trade between countries), 10-†231-42
  - Oriental, 10-235-38, 242; 7-434
  - money as medium of exchange, 7-502
  - power of Congress to regulate commerce, 7-361, 364
  - Renaissance, 10-167-71; 7-112
  - resulting from Crusades; significance, 5-283
  - "silent trade" in New Guinea, 5-471
  - spice, 9-206
  - stock exchange**, 7-†580-87
  - tariffs, 7-576
  - transportation, 10-134, †161-63; 7-500, 573, \*577
    - canals, 10-†166, †273, 274
    - see also above subhead* merchant marine
  - see also Fur Trade; Trade routes*
- Trade Acts**, British, 7-159
- Trade-marks**, a form of picture writing, 10-37
- Trade routes**, 10-264
  - Cape of Good Hope route, 10-238, 239
  - coaling stations, 10-237, 238
  - North Atlantic route, 10-233-34
  - North Pacific, 10-241
  - ocean, 10-233-42
  - Orient, 10-235-38, 242
  - Suez highway, 10-236
  - Teheran to Baghdad, 10-264
- Trade treaties**, reciprocal, *see* Reciprocal trade treaties
- Trade unions**, 7-540, 562, 563
- Trade winds**, 1-225
- Tradewater River**, Ky., 8-138-A
- Trafalgar, Battle of**, 6-87, \*88; 10-171; 12-422, 430
- Trafalgar Square**, London, 12-420
- Traffic**, city
  - direction of, 7-345
  - pedestrian rules for safety, 2-428
  - problems, 7-394
  - safety precautions in, 2-432, 433
- Traffic lights**, 2-442
- Tragedy**
  - Eugene O'Neill, 13-354
  - French, 12-331
  - Greek
    - actors' costumes, 12-325
    - Aeschylus, 13-33, 34
    - Euripides, 13-38
    - Sophocles, 13-36
  - mask used in, 13-\*38
- Tragedy**, muse of, 14-412; 12-\*205
- "Tragic Muse, The,"** painting of Mrs. Siddons, 11-\*298
- Trailing**, glassmaking process, 12-31
- Trailing arbutus**, or **mayflower**, state flower of Massachusetts, 8-176-B
- Trails**
  - Nebraska, 8-224
  - Oregon, 8-449
  - western, 8-393
- Trains**
  - lumber, 9-\*253
  - railroad, *see* Railroads
  - refrigeration on, 1-409; 10-518
  - stream-lining, 10-\*175, \*185
- Trajan** (Marcus Ulpius Nerva Trajanus), Roman emperor, reign, 5-240
  - conquest of Dacia, 5-240, 247
  - picture on coin, 11-69; bust, 11-\*60, 69
- Trajan, Column of**, Rome, 12-\*104
- Trajan, Forum of**, Rome, 11-65
- "Tramp Abroad, A,"** by Mark Twain, 13-330
- Tramp steamers**, 10-232, 236
- Trans-Andean Railway**, 10-200
- Trans-Canada Air Lines**, 7-33-I
- Trans-Pecos Province**, section of Texas, 8-386
  - map, 8-549
- Trans-Siberian Railway**, 10-185, 186
- Transatlantic steamship lines**, 10-221-24
- Transcaucasia**, republic, U.S.S.R., maps, 6-601, 5-580
- Transcendental Club**, 13-305
- Transcontinental highways**, 10-156
- Transcontinental railways**
  - Canada, 7-24, 28
  - United States, 10-†190 fol.; 7-†278
- Trans-Iranian railroad**, 10-262
- Transept**, of church, 11-\*457
- Transfer designs**, 12-46
- Transformers**, electrical, 1-†510, 511
- Transit instrument**, 1-186
- Transit of Mercury**, 1-146
- Transit of Venus**, 1-\*147, \*148, 149
  - observed by Captain Cook, 13-489
- Transit ports**, 10-246
- Transjordan**, country, Asia, 5-401
  - maps, 5-582, 580
- Transmigration of souls**, 13-4
- Transmission**, automobile, 10-†289, \*290; 1-331
- Transmission of light**, 1-†428
- Transmitter**
  - telephone, 1-†518-20; 10-110, \*111
  - wireless telegraph, 10-116
- Transparent object**, 1-427, †428
- Transpiration** in plants, 2-51, 53
- Transportation**, main article, 10-†128-328 (*see also* Contents Volume 10 for chapter headings)
  - Abyssinia, 5-461
  - Asia, 10-264
  - airplanes**, 10-†312-28
  - animal power
    - burro, 10-\*132
    - camel, 4-†398; 10-\*132

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Transportation, animal power—continued**

dog, 4-498, 500; 6-\*346, 348; 10-129, 130, \*133

donkey, 4-\*506; 6-\*313; 10-\*130

elephant, 10-\*133

horse, 4-\*506, 510; 10-\*128, \*133

llama, 4-400

ox, 10-\*133

reindeer, 10-\*133

water buffalo, 4-394

yak, 4-396

**automobiles**, 10-†277-91

banana; Central America, 7-41

bicycles, 10-\*142

**bridges**, 10-†209-14

**canals**, 10-†269-74

caravan, 5-\*58, \*66; 9-\*206

prairie schooner, 10-\*153

chemistry's contributions, 10-548

city, 7-†399

clipper ships, 10-172; 7-242

coal mine, 9-\*439, \*444

coconuts, 2-\*209

**compass**, 10-†454-57

copper mine, 9-\*416

covered wagon, 10-\*146, 148; 7-\*231-32, \*281 during war

aircraft carrier, 7-487

bombs, 10-364

food and equipment, 7-\*314

motor trucks, 7-\*319, \*426

tanks, 10-\*363, 367; 7-\*318; 12-\*548

troops, 7-\*487

effect on price of coal, 9-444

elevated railroads, 7-399; 10-\* 98

elevator, 1-†337

escalator, 1-†337

government regulation

city, 7-399

Interstate Commerce Commission, 7-288

Transportation Act, 7-332

Great Lakes, 8-308

**highways**, 10-†150-56

in early nineteenth century, 7-214, \*218, 241

**locomotives**, 10-†175-83

log hauling, 9-\*253

log rolling, 9-\*251, 252

mail, 10-85 fol.

man power, 10-†129, 130, \*131, \*132

jinrikisha, 5-\*348

mail carrier, 7-\*376

packs carried, 7-\*43

water carriers, 10-†537; 5-\*409

merchant marine, 10-†231-32, \*235, \*237 239-40, 242

milk, 9-\*336, \*337

motorcycle, 7-\*393

national parks, 7-405

**ocean liners**, 10-†293-304

**pipe lines**

oil, 9-\*452, \*453, 454

oil and gas, 8-384

**Transportation, pipe lines—continued**

sewage, 7-397, \*398

water, 7-398; 10-\*536

pneumatic tubes, 7-400

Pony Express, 10-\*87, 88, †190; 12-574

prices affected by, 7-502

coal, 9-444

**primitive methods of land transportation**, 10-†128-34

**primitive methods of water transportation**, 10-†136-40

**railways**, 10-†185-200

refrigerator cars, 9-\*153, †329; 10-518

**river**, 10-†252-68

**roads**, 10-†150-56

sailing by the stars, 10-454

**sailing ships**, 10-†158-73

stagecoach, 10-\*88, †144 fol., \*151, †190

**steam engine**, invention of, 10-†395-401

**steamboats**, 10-†216-24

streamlining of vehicles, *see* Streamlining

street car lines, 7-399

**submarines**, 10-†306-10

subway, 7-399; 10-\*198

tank car, 9-\*337

tank truck, 9-\*337

tobacco, 9-\*222

trade affected by, 7-573, \*577

trade routes, *see* Trade routes

**tunnels**, 10-†202-7

**water**

Egyptians, 5-144

importance of seaways, 10-163

Phoenicians, 5-109, †110

Russian rivers, 6-368

*see also* Boats; Canals; Ships; Water conveyances and travel

water supply, 10-\*535, \*536, †537, 538, \*541

**wheeled vehicles**, 10-†142-48

world wide, carried by ships, 10-224

*see also under main subjects listed above, as*  
Airplanes; Automobiles, etc.

**Transportation Act**, United States, 7-332

**Transportation systems** of cities, 7-†399

**Transposition ciphers**, in secret writing, 14-146

**Transvaal**, prov., Union of South Africa, history, 5-†484-91

annexed to British empire, 5-489

asbestos, 5-491-B

beginning of, 5-481

Boer Wars, 6-101

made a republic, 5-482

map, 5-577

**Transylvania**, early name for Kentucky, 8-135

**Transylvania**, now part of Roumania

climate, 6-368-A

coal mines, 6-368-B

map, 6-594

struggle for Hungarian independence, 6-282

**Transylvania Land Company**, 7-214

**Transylvania Plateau**, Roumania, 6-368-A

**Transylvanian Alps**, mts., Roumania, map, 6-594

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Tranum, Frances Hannah**, song by, 8-374  
**Trap rock**, in physiography, 8-268  
**Trapdoor spider**, 3-\*410, 411  
**Trapezius**, muscle, 2-\*328  
**Traps**  
   for fishes, 9-363, \*368, \*369  
   for fur-bearing animals, 4-357, 360  
**Trasimene, Lake**, Battle of, 5-215  
**Travel**  
   a trip on an ocean liner, 10-†293-304  
   during Roman Empire, 5-242  
   medieval pilgrimages, 11-90  
**"Travel Pictures,"** by Heinrich Heine, 13-286  
**Traveler**, Robert E. Lee's horse, 12-525, 526;  
   7-\*257; 8-406  
**Travelers' expenditures** classed as imports, 7-513  
**"Traveller, The,"** by Oliver Goldsmith, 13-198  
**"Travels of Marco Polo, The,"** 5-329  
**"Travels with a Donkey,"** by Robert Louis  
   Stevenson, 13-265  
**Traverse, Lake**, on Minnesota-South Dakota  
   boundary, 8-364  
**"Traviata, La,"** by Giuseppe Verdi, 12-299, 300  
**Travois**, a V-shaped drag, 10-\*128, 129, 143;  
   7-\*104  
**Trawlers**, fishing, 9-†363  
**Treadmill**, 1-\*505  
**Treadwell mines**, Alaska, 8-13  
**"Treasure Island,"** by Robert Louis Stevenson,  
   13-265  
**Treasure State** (Montana), 8-220-A  
**Treasury, Department of the**, *see* United States,  
   Treasury Department  
**Treasury Building**, Washington, D. C., 7-\*372,  
   \*495  
**Treaties**  
   between Ramses II and Hittites, 5-68  
   disarmament and peace treaties after World  
   War I, 7-338  
   U. S., making of, 7-373  
   *see also name of treaty, as* Brest Litovsk, Treaty  
   of  
**"Treatise of Human Nature,"** by David Hume,  
   13-16  
**Treaty making power of president**, 7-365  
**Treaty of Amity and Commerce**, between France  
   and the United States, signing of, 12-\*467  
**Treaty of Friendship with the Indians**, Penn's,  
   12-\*461, 462  
**Treaty Stone**, Limerick, 6-\*161  
**Trebia, Battle of**, 5-215  
**Tree boa**, skull, 3-\*499  
**Tree cricket**, 3-\*349  
**Tree ducks**, 4-\*121  
**Tree dwellings**, East Indies, 5-523  
**Tree ferns**, 2-†90  
   ancestors of, 3-29  
   prehistoric, 3-51  
**Tree frog** (tree toad), 3-\*418 fol., \*68  
**Tree houses**, 11-\*396, \*397  
**Tree kangaroo**, 4-462  
**"Tree of Life"** design in mosaics, 12-\*113  
**Tree Planters' State**, 8-228-A  
**Tree shack**, how to make, 14-†44  
**Tree shrew**, 4-281  
**Tree snake**, 3-498, \*500  
**Tree sparrow**, 4-126, †127  
**Tree swallow**, 4-\*34, †36  
**Tree toad** (tree frog), 3-†423-25, \*68, \*418, \*420  
**Trees, identification**, main article, 2-†266-76  
   annual rings determine age, 2-\*28, 30  
   Apetalae group, 2-†158-60  
   cells of hardwood tree, 2-\*8  
   conifers, 2-†74-99, \*266-69  
   Constable's eulogy on a tree, 11-316  
   damaged by sap-sucking birds, 4-†73  
   deciduous, 2-\*268, \*270-76  
   leaves of, 2-\*25  
   evergreen, *see* Evergreen trees  
   extreme age, 2-260  
   forest nurseries, 2-\*243, 245  
   forest preservation, 2-†240-47  
   fossilized, 3-\*5, 6  
   in coal, 9-436  
   giant, 9-\*6, †98, \*245, \*247, \*250  
   sequoia the largest, 2-249, \*253; 7-\*404  
   Sequoia National Park, 8-42-B; 7-\*404  
   girdled, 2-\*30, 236  
   grafting, 2-†231  
   growth depends on light, 1-\*216  
   hard and soft wood, 9-257  
   having spring sap flow, 2-237  
   heart rot, 2-71  
   how sugar is made and used by, 2-235, 237  
   in Oligocene period, 3-53  
   Japanese, care of: in winter coverings, 5-\*345  
   leaves, 2-†23 fol.  
   length of life, 2-259-60  
   oak, 2-159, 260  
   redwoods, 2-\*6  
   Sequoias, 2-249  
   petrified, 2-\*257; 3-\*5, 6; 9-315  
   planting of, on Arbor Day, 14-583  
   pollard, 2-\*133  
   position of moss on, 14-567  
   rainfall and the growth of, 2-197  
   resin from, 9-313  
   roots, 2-35 fol.  
   rubber from, 9-263, †264, \*265  
   spruce used in rayon manufacture, 9-\*84, 86  
   stem, 2-†28-31  
   tulip tree; diagram, 2-\*33  
   tapping of, *see* Tapping of trees  
   tree crops used for conservation, 7-462, 463  
   useful products from, 9-245  
   uses for various woods, 9-258  
   water, flow and evaporation, 2-237  
   *see also* Forests; Lumber and lumbering;  
   Reforestation; *also names of trees, as* Maple  
**Trefoil**, Gothic decoration, 11-464; 12-184  
**Trek of Boers**, 5-480  
   Kruger in, 5-486  
**Trench**, military, 7-\*328; 10-361-62  
**Trench gun**, toy, how to make, 14-†38

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Trengganu**, river, Malay Peninsula, 5-430-B  
**Trengganu**, one of nine native states in the federation known as Malaya, 5-430-B  
**Trent**, river, England, map, 6-573  
**"Trent,"** ship, and Mason and Slidell, 7-258  
**Trent, Council of**, raises standard of church music, 12-260  
**Trenton, N. J.**, 8-\*244, 247  
     "Lenox" pottery, 12-61  
**Trenton, Battle of**, 7-\*169  
**Trepang**, sea cucumber, 3-139  
**Trestle**, bridge, 10-210  
**Trevithick, Richard** (Cap'n Dick), builds first steam locomotive, 10-177, \*179  
**Trial by jury**, introduced into England, 6-†21  
**"Trial by Jury,"** operetta by Gilbert and Sullivan, 12-320  
**Trial by ordeal or combat**, 6-21  
**Triangle**, geometric figure, 10-†439  
**Triangle**, percussion instrument, 12-258-C  
**Triangle spider**, 3-409  
**Trianon, Petit**, palace, Versailles, 11-\*489  
**Trianon, Treaty of**, 6-290  
**Triassic lowland**, plain, 8-249  
     New Jersey, 8-252  
     New York, 8-283  
     Pennsylvania, 8-340, 341  
**Triassic period**, 3-37, 39  
     forms of life in, table, 3-64  
     rock formation, 1-40  
**Tribal life**  
     American Indian, 7-†89-108  
     government, 5-32, 39; 7-346  
     man, prehistoric, 5-†23-40  
**Tribes of Israel**, 5-120  
**Triborough Bridge**, New York City, 8-\*270  
**Tribulation**, Cape, Australia, 5-547  
**Tribunes**, Roman, 5-199  
**"Tribute Money,"** painting by Masaccio, 11-\*133, 134  
**Triceps**, muscle, 2-\*328, 329  
**Triceratops**, prehistoric animal, 3-\*38  
**Tricks**, 14-†136-42  
     with cards, 14-†130-34  
     with figures, 14-97  
     see also Magic; Puzzles  
**Tricuspid valve**, anatomy, 2-\*375  
**Trident of Neptune**, 14-407  
**Trieste**, Italy, port on Adriatic, 10-260  
     made into free territory, 6-562  
     map, 6-588, D2  
     rioting, 6-\*559  
*Trifolium pratense*, 8-404  
**Triforium**, architecture, 11-\*474, †475  
**Trigger fish**, 3-\*195  
**Triglyph** in Doric frieze, 11-\*418, \*419, 421  
**Trigonometry**, mathematics, 10-425  
**Trillium** (wake robin), flower, 2-\*147  
**Trilobites**, prehistoric crustaceans, 3-10, 13, 18, 24, 64  
**Trilogy**, of Aeschylus, 13-33  
**Trimming**, term used for loading ship, 10-249  
**Trinidad**, island, West Indies, description, 7-66, \*65; general data, 7-54-B  
     maps, 5-602; 7-601  
**"Trinidad,"** ship of Magellan, 13-462  
**Trinitrotoluene** (T.N.T.), explosive, 10-418  
**Trinity Bay**, Newfoundland, terminus of Atlantic cable, 10-103  
**Trinity Church**, Boston, 11-\*515  
**Trinity College**, Durham, N. C., see Duke University  
**Trinity Parish**, library established, 10-556  
**Trinity River**, Texas, 8-386  
**Trio**, musical, 12-234  
**Triple Alliance**, 6-273  
**Triple Entente**, 6-273  
     Russia in, 6-438  
**Tripods**, ancient, 12-\*176, \*178, 180  
**Tripoli**, city, Africa, raided by Decatur, 9-207  
**Tripoli**, dependency, Africa, see Libia  
**Tripolitania**, dist., No. Africa, 5-451, 455  
**Triptychs** by early painters, 11-\*193  
**Trireme**, galley, 10-\*162, 163  
**"Tristan and Isolde,"** opera by Wagner, 12-251, 252, 295  
     bass clarinet used in, 12-258-B  
     English horn used in, 12-258-A  
**Tri-State Field**, Missouri, lead and zinc mines, 8-212  
**Tristram**, Sir, knight, 13-\*145, 146; 6-211  
**"Tristram,"** poem by Robinson, 13-349  
**"Tristram Shandy,"** by Sterne, 13-189, 190  
**Triton**, sea spirit, 14-435  
**Tritium**, isotope of hydrogen, 1-559  
**"Triumph of the Egg, The,"** by Sherwood Anderson, 13-351  
**Triumphal arch**, 6-\*346; 11-†291  
**Triumphal March** from "Aida," 12-253  
**Triumphs**, Roman ovations, 5-\*228  
**Triumvirates**, Roman  
     first triumvirate, 5-223; 12-357  
     second triumvirate, 5-225; 12-362  
**Trochus** (top shell), 3-141-43, 149  
**"Troilus and Cressida,"** by Chaucer, 13-143  
**Trojan War**  
     Schliemann's discoveries concerning, 5-143  
     story of Hector, 5-\*151  
     story of, in "Iliad," 13-27, 28  
**Trojans**, Roman descent from, 5-204  
**"Trojans, The,"** opera by Berlioz, 12-306  
**Trolley cars**  
     circuit breaker, 1-312  
     voltage used to operate, 1-510  
**Trombetti, Professor**, efforts toward deciphering Etruscan inscription, 5-192  
**Trombone**, musical instrument, 12-258-B  
     pitch variation, 1-449  
**Tromp**, Admiral, hoists broom from mast, 10-170  
**Trondhjem**, Norway, Academy of Sciences, founded, 6-388  
**Troops**, used in labor disputes, 7-290, †333  
**Tropes**, religious dramas, 12-326  
**Tropic**, in earth's revolution, 1-204

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Tropic**, of Cancer; of Capricorn  
calms, 1-225  
solstice, 1-111, 204
- Tropic (boatswain) birds**, 4-215
- Tropical birds**, main article, 4-†177-83
- Tropical National Park**, Florida, 8-76-A
- Tropics**, 1-204; 5-473-A  
civilization of, 1-†194, 195, \*196  
fruits, 9-†193-96  
importance of palms, 9-190, 191  
primitive dwellings, 11-\*396  
vegetation, 2-196, 258  
ferns, 2-90
- Trotsky, Leon**, Russian leader, 6-439, 442  
biographer of Stalin, 12-\*449-E  
portrait, 6-\*441
- Troubadours**, 12-\*201, 216; 6-169
- Trousers**  
fashions in, 9-\*17, 18  
first worn, and why, 9-12
- Trout**, fish, 3-235, †236, \*237, \*241  
eggs, 10-\*489  
Gunnison River abundant in, 8-52-A  
lake trout, 3-\*68; 9-308  
rainbow trout, 9-\*367
- Trouvères**, poet-musicians, 12-216
- "Trovatore, Il,"** opera by Giuseppe Verdi, 12-253, 300
- Troy**, ancient city of Homer (?), 5-15  
archaeological discoveries, 5-\*15, 16, 143; 11-31  
bronze made in, 12-14  
story of siege of, in "Iliad," 13-27, 28  
wooden horse of, 13-30
- Troy, N. Y.**, industrial importance, 8-281
- Troy weight**, 10-374, 375
- Troyes**, France, origin of Troy weight in, 10-374
- Troyes, Treaty of**, 6-36, 174
- Trucial Oman**, British protectorate, 5-336-D
- Truck**, motor, 10-281; fire truck, 2-\*244
- Truck gardening**, 9-†150-54, \*148  
Florida, 8-\*72, 74  
New Jersey, 8-245, 248  
North Carolina, 8-293  
Ohio, 8-310  
Virginia, 8-414
- "True-born Englishman, The,"** by Defoe, 13-176
- Truffles**, mushroom, 2-76
- Truman, Elizabeth** (Mrs. Harry S. Truman), 12-564
- Truman, Harry S., President of the United States**, 12-456-E; 7-343-43-A; 1-559  
portrait, 7-343-A
- Truman Doctrine**, 6-562
- Trumbull, John**, artist, 11-\*354  
paintings, 11-\*354; 7-\*164
- Trumpet**, musical instrument, 12-258-B  
imitated by organ, 12-258-D
- Trumpet snail**, 3-259
- Trumpet worm**, tube of, 3-\*121
- Trumpeter swan**, bird, 4-113, \*118
- Trumpets**, of Hebrews, 12-\*204, 205
- Trunk**, of elephant, 4-338  
evolution of, 3-\*54
- Trunk**, of body, color plate, 2-\*278
- Truss bridges**, 10-214, 443
- Trusts**  
Clayton Act, 7-315  
outrery against: Roosevelt's "trust-busting activities," 7-308  
power and influence, 7-282  
Sherman Anti-Trust Act, 7-289, 308  
Standard Oil Company, 12-583
- "Truth, The,"** drama by Clyde Fitch, 13-354
- Tryon, William**, colonial governor of North Carolina, 8-291
- Trypanosoma**, protozoans, 2-\*18
- Tschaikovsky, Peter Ilich**, life and works, main article, 12-314, 255  
Sixth, or "Pathétique," Symphony, 12-236
- Tserclaes, Johann**, count of Tilly, *see* Tilly, Johann Tserclaes, count
- Tsetse fly**, disease carrying insect, 3-365; 2-\*18
- Tsimshian village**, British Columbia, 7-\*17
- Tsunayoshi**, Japanese shogun, 5-359
- Tsushima, Battle of**, 6-438
- Tuamotus**, Pacific islands, 5-529
- Tuaregs**, a desert people, 5-473
- Tuatara**, lizard, 3-\*33, 31, 462
- Tuba**, musical instrument, 12-258-B
- Tube-building worms**, 3-†117-23
- Tube feet of Echinoderms**, 3-130, 137, \*139
- Tube-nosed birds**, 4-217
- Tuber**, plant stem, 2-32
- Tuberculosis**  
bacilli, 2-13 fol  
fight of blood and lymph against, 2-†347  
National Tuberculosis Association, 7-423
- Tuberose**, perfume from, 9-301
- Tubers**, potato and yam, 9-145
- Tubes**, under-water tunnels, 10-202, \*205, 206-7
- Tubing**, vinylidene chloride plastic used to make, 10-553
- Tubular (disk) flowers**, 2-175
- Tucca**, Virgil's writings willed to, 13-49
- Tuckahoes**, poorer class of Virginians, 8-418-A
- Tuckerman Ravine**, New Hampshire, 8-\*236
- Tuckoes**, nickname for people of North Carolina, 8-296-A
- Tucson, Arizona**, 8-19
- Tudor, Henry**, earl of Richmond, *see* Henry VII, king of England
- Tudor, Owen**, founder of Tudor line in England, 6-140
- Tudor, house of**  
Elizabethan Age, 6-†50-57  
rule in England, 6-39, †41-48
- Tudor rose**, ornament, 11-†474
- Tudor style** in architecture, 11-475
- "Tuebor,"** motto, 8-186-B
- Tuesday**, origin of name, 10-483
- Tufa**, rock, 8-18
- Tufted puffin**, bird, 4-208

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Tufted titmouse**, bird, 4-<sup>\*</sup>63  
West Virginia's state bird, 8-436-B,  
where found, 4-62
- Tug Fork**, river of Kentucky and West Virginia, 8-138-A
- Tug of war**, game, 14-174  
indoor, 14-159
- Tugaloo River**, U. S., 8-356
- Tugboat**, model, how to make, 14-<sup>+</sup>34
- Tuileries**, Paris, royal family imprisoned in, 6-<sup>\*</sup>190
- "Tuk, Little,"** fairy tale, text, 14-<sup>+</sup>207-8
- Tulbagh**, Ryk, rule in South Africa, 5-478
- Tulbend**, wild flower, tulips bred from, 2-230
- Tulip tree**, 2-<sup>\*</sup>273  
view of stem sections, 2-<sup>\*</sup>33
- Tulipomania** in Holland, 2-230
- Tulips**, flowers, 2-184, <sup>\*</sup>229  
breeding of, 2-230, 233
- Tulp**, Doctor, portrait by Rembrandt, 11-<sup>\*</sup>272
- Tulsa**, Oklahoma, oil output, 8-319  
church, 8-<sup>\*</sup>319
- Tumacacori National Monument**, Ariz., 8-24-A
- Tumblebug**, 3-<sup>+</sup>329, 331
- Tumbleweeds**, various plants with unusual  
method of seed dispersal, 2-212
- Tumor**, male, not growth, radium used in treatment of, 9-426
- Tuna fish**, 9-368
- Tundra**, Arctic prairie perpetually frozen beneath  
surface, 2-195; 8-16-A  
Canada, 7-29-1  
Russia, 6-443-A  
vegetation, 2-178; 4-229
- Tung oil**, 9-312; 10-547
- Tungchow**, China, 10-264
- Tungsten**, metallic element, 9-422  
melting point, 1-<sup>\*</sup>392  
South America, 5-518-B  
uses, 1-536  
wire, in electric lamp, 1-525; 10-392  
*see* Wolfram
- Tungsten steel**, 1-536; 9-422
- Tunguska River**, upper and lower, map, 5-581
- Tunic**, costume, 9-<sup>\*</sup>7, 12, <sup>†</sup>16
- Tuning fork**, 1-455
- Tunis**, Tunisia, Africa  
headress, 9-<sup>\*</sup>88
- Tunisia**, country, Africa, 5-455; general data,  
5-473-C  
agriculture, 5-473-C, 455  
annexation by France, 5-454  
area, 5-473-C  
climate, 5-473-C  
government, 5-473-C  
location, 5-473-C  
map, 5-574  
part of Barbary Coast, 5-451  
people, 5-473-C  
physical features, 5-473-C  
products, 5-473-C  
phosphates, 1-97
- Tunja section**, Bulgaria, 6-368-A
- Tunnels**, main article, 10-<sup>+</sup>202-7  
compressed air used in construction of, 1-<sup>+</sup>461-62  
Holland Tunnel, New York, 1-<sup>+</sup>460-62  
Lincoln Tunnel, New York, 8-270  
New York water system, 10-<sup>\*</sup>539, <sup>\*</sup>541  
through mountains, 10-<sup>+</sup>203-6, <sup>\*</sup>207  
through the Andes, 10-200  
under water, 10-202, <sup>\*</sup>205, 206-7
- Tuolumne River**, Calif., 8-42
- Tuornabuoni**, Lorenzo, bride of, 11-<sup>\*</sup>146, <sup>†</sup>147
- Tuornabuoni family**, portraits, 11-<sup>\*</sup>144, 145,  
146, 147
- Tupaea**, Tahitian chief, aids Captain Cook, 5-533
- Turbine engine**, 10-401
- Turbines**, steam, use in power stations, 1-506,  
507, 508
- Turbines**, water, operation of, 1-370
- Turbot**, fish, 3-202, 204
- "Turcaret,"** by Alain René Le Sage, 13-116
- Turgeneff**, Ivan, life and works, 13-92-93  
relations with Tolstoy, 13-91
- Turgot**, Anne Robert Jacques, baron de  
L'Aulne, 6-188
- Turin**, Italy, industry, 10-260  
map, 6-588, A2
- Turkestan**, region, Asia, description, 5-<sup>+</sup>435-36
- Turkestan**, Eastern or Chinese, Asia, 5-436
- Turkey**, country, Europe and Asia, main article, 5-<sup>+</sup>403-14; general data, 5-414-B  
area, 5-414-B  
bath sandal, 9-<sup>\*</sup>54  
chest, 12-<sup>\*</sup>99  
climate, 5-414-B  
court of sultans; harems, 5-413  
crafts  
carved chest, 12-<sup>\*</sup>99  
lusterware, 12-56  
rugs, 12-148, <sup>\*</sup>149, <sup>\*</sup>151  
death penalty for smokers, 9-222  
emancipation of women, 5-414, 420  
flag, 14-572  
color plate, 14-following 570, no. 64  
flour grinding, 9-<sup>\*</sup>234  
former possessions in the Mediterranean, 6-478, 480  
government, 5-414-B, 412, 414  
history, 5-<sup>+</sup>403-14  
before conquest by Turks, 5-<sup>+</sup>403-11  
pathways to the East cut off by, 10-167  
after capture of Constantinople, 5-<sup>+</sup>411-14  
capture and loss of Greece, 5-182  
empire at its height, 5-403  
rule in Africa, 5-448, 454  
in Egypt, 5-72  
siege of Malta, 6-476, 478  
in the Balkans, 6-357, 362, 363  
loss of Balkan countries, 5-414  
Arabia held and lost by, 5-400-1  
wars with Russia, 6-436; 12-417

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Turkey**, history—*continued*  
 Crimean War, 6-98, 436  
 becomes "the Sick Man of Europe," 5-413  
 withdraws from Tripoli, 6-310  
 World War I, 5-414  
 republic established: reforms, 5-414  
 alliance with Russia, 6-241  
 Jews in, 5-137  
 location, 5-414-B  
 maps, 5-580  
   Turkey in Asia, 5-582  
   Turkey in Europe, 6-595  
 merchant marine, number, 10-232  
 minerals, 5-414-B  
 people, 5-414-B  
 physical features, 5-414-B  
 rugs, 12-†148-49, \*151  
 tobacco, 9-223  
*see also* Turks and index World War II, 6-493
- Turkey, water**, 4-149, color plate, \*152
- Turkey buzzard**, *see* Turkey vulture
- Turkey cup sponge**, 3-87
- Turkey vulture** (turkey buzzard), 4-162
- Turkeys**, 9-\*353, \*355, 358; 14-\*588  
 drawing and mounting, 14-\*69  
 wild, 4-78, \*93, \*94
- Turkic tribes**, in Soviet Russia, 6-443-A
- Turkish rugs**, 12-†148-49, \*151
- Turkmenistan** (Turkoman Soviet Socialist Republic), Asia, 6-443-B  
 map, 6-602
- Turkomans**, people, 5-†435, 436
- Turks**, people, 5-414-B  
 capture Jerusalem, 5-281  
 defeat at Lepanto, 6-327  
 defeated by John Sobieski, 6-451  
 gain control of Asia Minor, 5-410  
 Janizaries, soldiery, 5-411, 412  
 native life and customs, 5-\*406, \*409-11  
 Seljuk Turks in Asia Minor, 5-408, 410  
 spread of; warfare with Christians, 5-270, 281, †282  
 subdue Transylvania, 6-282  
 titles of rulers, 5-411, 412  
 Venice injured by, 6-302  
 Vienna besieged by, 6-262, 263  
 wars with Hungary, 6-\*280, †281-82  
*see also* Turkey
- Turks and Caicos Islands**, West Indies, 7-54
- Turk's cap lily**, 2-\*146
- Turku**, Finland, university town, 6-457
- Turmeric**, spice, 9-209
- Turner, Joseph**, employer of Joel Chandler Harris, 13-339
- Turner, Joseph Mallord William**, life and art, 11-†311-15  
 color in paintings, 11-344  
 Ruskin's defense of, 11-314; 13-237  
 sketch book, 11-230
- Turnip**, vegetable, 9-150
- Turnpikes**, earliest, 10-146, 153
- Turns**, driving, 2-442  
 diagram, 2-444
- Turpentine**  
 boiling point, 1-\*392  
 Florida, 8-\*73  
 distillation, 9-\*311  
 source and uses, 9-\*309, 313; 10-547
- Turpentine State**, nickname for North Carolina, 8-296-A
- Turquoise**, precious stone, color plate, 9-  
 frontispiece  
 supposed to bring good luck, 9-433
- Turtle Mountains**, North Dakota and Manitoba, Canada, 8-302
- Turtles**, reptiles, 3-466-67, \*473 fol.  
 drawing and mounting, 14-\*66  
 earth supported by, myth, 1-\*101, 102  
 eggs and nesting, 3-478  
 largest, 3-\*480  
 on Cayman Islands, 7-55  
 prehistoric, 3-57  
 shell, 3-466, 473, †475, 478
- Tuscaloosa** ("Black Warrior"), Indian chief, 8-4
- Tuscaloosa, Ala.**, 8-2
- Tuscan Order**, architecture, 11-430
- Tuscany**  
 constitution granted, 6-307  
 speech made Italy's national speech, 6-290
- Tuscarawas county**, Ohio, coal mining, 8-311
- Tuscarawas River**, Ohio, 8-312-A
- Tuscarora Indians**  
 admitted to Iroquois League, 8-275  
 North Carolina, 8-288  
 West Virginia, 8-432
- Tuskegee Institute**, 12-\*569, †570
- Tusks**  
 elephant, 4-337, 340; 5-\*466  
   prehistoric, 3-†54-56  
 evolved from teeth, 2-314  
 hog tribe, 4-†433, 434, 437  
 narwhal, 4-448  
 walrus, 4-332
- Tussur silk**, 9-44
- Tussur worm**, 9-44
- Tutankhamon**, king of Egypt, 5-64  
 moves capital to Thebes, 11-19  
 tomb, 5-†7 fol.; 10-\*40; 12-120
- Tutelo Indians**, 8-288
- Tutuila**, island, Samoa, 8-466
- Tuxedni Bird Refuge**, 8-16-B
- Tuxtla Statuette**, Mayan calendar, 10-\*478
- TVA**, *see* Tennessee Valley Authority
- Twain, Mark**, *see* Clemens, Samuel Langhorne
- Tweed, William Marcy** (Boss Tweed), political  
 frauds, 7-282
- Tweed**, river, Scotland, map, 6-575
- Tweed Ring**, 8-277
- "Twelfth Night"**, drama by Shakespeare, 13-158

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Twelve Labors of Hercules**, Greek Myth, 14-†426-30
- Twelve Pole**, stream of West Virginia, 8-436-A
- Twentieth ("Lame Duck") Amendment** to Constitution, 7-337
- Twentieth century**, scientific advances, 1-414
- Twenty-first Amendment** to Constitution, 7-336
- "Twice-Told Tales,"** by Nathaniel Hawthorne, 13-300
- Twickenham**, England, Alexander Pope's retreat, 13-184
- Twilight**, cause of, 1-140
- "Twilight of the gods,"** mythology, 6-377
- "Twilight of the Gods, The,"** opera by Wagner, 12-†251, 296
- Twin Cities**, 8-196
- Twin screw propellers**, 10-223
- Twin Sisters**, nickname for Dakotas, 8-302-A
- Twin stars**, 1-174
- Twine**, in rope making, 9-\*283, 285, 288
- Twine binder** invented, 10-413
- Twins** (Gemini), constellation, 1-178  
star maps  
Jan. and Feb., 1-178-B  
March and April, 1-178-D  
May and June, 1-178-E  
Nov. and Dec., 1-178-K  
zodiac, 1-\*170
- "Twister,"** storm, 1-\*229, 230
- Two-handed snake**, lizard, 3-458
- "Two Natures in Man, Struggle of the,"** sculpture by George Grey Barnard, 11-\*374
- Two hundred families**, in France, 6-202
- "Two Solitudes,"** novel by Hugh MacLennan, 7-29-I
- Two-toed (pigmy) anteater**, 4-451-52
- Tydings-McDuffie Act**, 5-570
- Tyler, John**, president of the U. S., 12-456-E  
elected vice president, 7-228  
favors annexation of Texas, 7-236  
vice-presidency, 12-456-G
- Tyler, Julia Gardiner** (Mrs. John Tyler), 12-562
- Tyler, Wat**, peasants' leader, 6-\*31, 32
- Tympanic membrane of eardrum**, 2-303
- Tympani**, or kettledrums, 12-258-C
- Tyndale, William**, Bible translated by, 10-\*13
- Tyndall, John**, **life and work**, main article, 13-†389-90  
portrait, 13-\*390
- "Typee,"** by Herman Melville, 13-324, 325
- Types, printing**, 10-48, \*49, 51, 58  
linotype, 10-†53, \*58, 60, 78, 81  
monotype, 10-†55, 60
- Typesetting**  
by hand, 10-58, †60, 77  
by machine, 10-†53 fol., 78, 81
- Typewriter**, 10-†64
- Typhoid fever**  
bacilli of, 2-12, \*13-14  
inoculation for, 14-556
- "Typhoon,"** by Joseph Conrad, 13-274
- Typhoon**, wind, 1-230
- Tyrannosaurus**, prehistoric lizard, 3-\*38, 41, \*435
- Tyrants**, Greek, 5-157, 160  
ostracism of, 5-160, 161
- Tyre**, Phoenicia, 5-112  
map, 5-\*112
- Tyrian purple**, 5-111  
how obtained, 9-305  
worn by Romans, 9-12; 12-181
- Tyrol**, province, Austria  
Alps, 6-\*274  
becomes part of Austria, 6-260  
map, 6-586, A3  
struggles for independence, 6-\*269, \*270, \*272
- Tyrone, Hugh O'Neill**, earl of, 6-153
- Tyrrhenian Sea**, part of Mediterranean Sea, 6-476  
maps, 6-589, 570
- T'zu Hsi**, empress dowager of China, 5-333, 334



- U.P.** (United Press), 10-79
- U.S.S.R.**, *see* Union of Soviet Socialist Republics
- U-turn**, driving, 2-442
- Uccello, Paolo** (Paolo di Dono), mastery of perspective, 11-137, 193
- Uchatius, Franz von**, baron, 10-502
- Uganda**, country, Africa, 5-462  
equator cuts across, 5-461  
exports, 5-462  
map, 5-575
- "Ugly Duckling, The,"** by Hans Christian Andersen, 13-85
- Uinta Mountains**, Utah, 8-391
- Ukraine**, republic, U.S.S.R., description, 6-†366-68, *see also* index World War II, 6-493  
agriculture, 6-366 fol.  
home of Cossacks, 6-367, 427  
importance of Dneprostroi dam, 6-440  
independence recognized by Russia, 6-439  
maps, 6-601, 602  
trade, 6-367 fol.  
transportation, 6-368
- Ukulele**, musical instrument, 8-457
- Ulan Bator Khota**, Mongolia, *see* Urga
- Ulfliot**, writes Constitution for Iceland, 6-419
- Ulm, Battle of**, 6-197
- Ulnar nerves**, 2-\*393

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Ulothrix**, alga, 2-68  
**Ulrich von Hutten**, *see* Hutten, Ulrich von  
**Ulrika Eleanor**, queen of Sweden, 6-405  
**Ulster**, province, Ireland  
     attitude toward Irish Free State, 6-106, 162  
     Protestant colonies planted in, 6-154  
     rebellion under O'Neill, 6-154  
**Ultra-violet rays**, 1-419; 10-494  
     effect on skin, 1-200  
     harden bone, 2-363  
**Ultramicroscope**, 10-489  
**Ulugh Mustagh**, mountain peak, Asia, height, 5-336-B  
**"Ululume,"** by Edgar Allen Poe, 13-315  
**Ulysses** (Odysseus), Greek hero  
     aided by Aeolus, 14-434  
     and Circe, 14-420  
     meeting with Nausicaa, 5-157  
     Odysseus and Ajax, Greek painting, 11-36  
     wanderings, 13-29  
**Umatilla Indians**, Oregon, 8-327  
**Umatilla River**, Oregon, 8-331  
**Umbel**, flower arrangement, 2-168  
**Umbrella bird**, 4-179  
**Umbria**, district, Italy, artists of, 11-140  
**Umpqua River**, Oregon, 8-331  
**Unaka Range**  
     Cahutta Range continuation of, 8-84  
     North Carolina, 8-296  
**Uncas**, Indian chief, hero of Cooper's novel, 13-297  
**"Uncle from Boston, The,"** opera by Mendelssohn, 12-286  
**"Uncle Ned,"** song, 8-138-B  
**"Uncle Remus,"** by Joel Chandler Harris, 13-339  
     quotation from, 3-465  
**"Uncle Tom's Cabin,"** by Harriet Beecher Stowe, 13-317, 319  
**"Uncle Vanya,"** by Anton Chekhov, 13-96  
**Uncompahgre Plateau**, Colo., 8-52-A  
**"Unconditional Surrender,"** Grant (Ulysses Simpson Grant), 12-536  
**"Under God the People Rule,"** motto of South Dakota, 8-364-A  
**"Under the Greenwood Tree,"** by Thomas Hardy, 13-264  
**"Under the Lilacs,"** by Louisa May Alcott, 13-321  
**Underclay of coal beds**, 3-28  
**Underglaze**, pottery, 12-46  
**Underground Railroad**, for fugitive slaves, 7-246, 248  
**Undersea earthquake**, 1-80  
**Undersea tractor**, 10-\*523, \*525  
**Underwing moth**, 3-288  
**Underwood Tariff**, 7-315  
**Undset**, Sigrid, 6-390  
**Unemployment**  
     C.C.C. camps founded to aid, 7-470  
     Elizabethan England, 6-53  
     relief, private and public, 7-336  
**Unemployment—continued**  
     Social Security Act, 7-343  
     technological, 7-545  
     United States, 1933, 7-339  
         Bonus Expeditionary Force, 7-\*330, \*337  
         NRA measures to reduce, 7-343  
**Unemployment insurance**, 7-544  
     England, 6-102  
     first state to enact, 8-446-A  
**"Unfinished" symphony**, by Franz Schubert, 12-243  
**Uni and Harkhuf**, earliest explorers in history, 5-56  
**Unicellular organisms**  
     animal  
         amoeba, 10-\*489  
         protozoa, 10-\*487-89  
     plant  
         algae, 2-66, 67, \*68, 69  
         bacteria, 2-†12-21  
**Uniforms**  
     Army, 7-\*473, 477  
     Boy Scouts, 14-551  
     British, 6-\*102  
     Marines, 7-\*491  
     Navy, 7-\*482  
**"Union, Justice, and Confidence,"** motto of Louisiana, 8-146-A  
**Union Iron Mills Company**, 12-565  
**Union Jack**, flag, color plate, 14-fol. 570, no. 27  
     history of, 14-573  
     used as basis of U. S. flag, 14-575  
**Union of English and Scottish parliaments**, 6-129  
**Union of Soviet Socialist Republics (U.S.S.R.)**  
     Europe and Asia, 6-443-B, 443  
     American attitude toward, 7-334  
     establishment of Soviet government, 6-†439-43  
     Finland granted independence, 6-457  
     Five-Year Plan, 6-440, 443  
     flag, color plate, 14-following 570, no. 66  
     maps, 6-601, 602  
     peasants' opposition, 6-441, 443  
     revolutionary movement and societies, 6-435, 436, 438, 439  
     *see also* Russia  
**Union of South Africa**, *see* South Africa, Union of  
**Union Pacific Railroad**  
     building of, 10-†190-92, †194; 7-†278  
     laying of last rails, 10-194, \*196  
**Union River**, U. S., ancient graves on, 8-149  
**Union Stock Yards**, Chicago, 9-\*327, 329; 8-\*100  
**Unions, labor**, 7-540  
**United Brethren in Christ**, 12-555-F  
**United Empire List**, Canada, 7-13  
**United Kingdom of Great Britain and Northern Ireland**, 6-108-B; 10-232  
**United Nations**, world organization, 6-552-55, \*551, \*558, \*559, 564  
     control of opium traffic, 9-218  
     flag, color plate, 14-following 570, no. 67  
**United Press (U.P.)**, 10-79

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**United States**, country, No. Amer., main article, 7-†110-343-B; general data, 7-343-C-343-F (*see also* Contents Volume 7 for chapter headings)

agriculture, 7-452 fol.

conservation essential, 7-465 fol.

corn belt, 9-104, 106

Department of Agriculture, *see* Agriculture, Department of

depression following World War I, 8-301

forage crops, 7-343-F

history, 7-458-60

"sharecroppers," 8-203

soil, 7-466

Soil Conservation Service, 7-470

wheat belt, 9-101

*see also under* United States, irrigation

Air Force *see* United States Air Force

Air Transport Service

airplane markings, 10-\*312

coöperation with Army and Navy, 7-487

animals, 7-343-F

architecture, 11-†495-524

Colonial (Georgian), 11-†501-8

early American, 11-†495-99

nineteenth and twentieth century, 11-†510-24

skyscrapers, 11-†515-24, \*510

area and location, 7-343-C

army, *see* United States Army

art, 11-†352-77, \*391

painting, 11-†353-72

sculpture, 11-\*358-61, 364, \*352, \*373-77, \*391

*see also* crafts *below*

banks

Federal Reserve, 7-315

Glass-Steagall Bill, 12-456-D

Reconstruction Finance Corporation, 12-456-D

budget, 7-374

canals, 10-†269-74

rights for Nicaraguan, 7-48-B

caves, 1-85

Census, Bureau of, 7-†379, 381

citizenship (text of Constitution of United States), 7-189

civilization: stages of growth varied, 8-323-24

climate, 7-343-D

*see also subhead* climate *under names of various states*

colonial life, *see* American colonial life

Commerce, Department of, 7-380; 9-365

conservation, 7-†466 fol., 309, 310

national monuments, 7-†416-21

national parks, 7-†404-9

natural resources, 7-†465-70

wild life refuges, 4-†516-18

*see also subheads* monuments; parks; reservations *under various states*

constitution, *see* United States Constitution

**United States**—*continued*

control of navigable waters, 10-250

costume, 9-\*14-15, \*22

crafts

furniture, 12-174, †195-99

glass and glassware, 12-†36-38

goldsmithing and silversmithing, 12-†90, \*91

porcelain, 12-61

Defense Department, 7-377

divisions, list of states, territories, etc., 7-343-F

eagle as emblem, 4-151

economic conditions

early struggles between agricultural and commercial interests, 7-204, 217

financial depressions

1786, 7-179

1832, 7-227-28

1873, 7-282, 283

1893, 7-290

1929, 7-339

financial situation after 1929, 7-339, 341

Industrial Revolution, 7-217, 241

far-reaching effects; Gilded Age following Civil War, 7-276-77, 281-83, 289

immigrant workers, 7-244

trusts, 7-308

industrialism; capitalists, 7-277, 282, 308

labor and capital after World Wars, 7-333, 343-A-B

labor organizations, 7-244, 283

paper money and wildcat speculation, 7-227

volume of business, 1924-47, chart, 7-546

wealth and optimism before 1929, 7-338

Fisheries, Bureau of, 9-365

flag, color plate, 14-following 570, number 68; \*573

first flags, 7-162, \*175; 14-†574

food inspection, 9-322, \*327, 328, 373; 1-\*552

foreign relations, *see* United States foreign relations

Forest Service, 2-242, 247; 7-380

rangers, 14-\*522, 567

fruit-growing region, 9-162

game laws, 4-518

geography, *see below* physical features

health: Public Health Service, 7-423, 443

historical monuments, 7-†411-14

history, *see* United States history

Ice Age, 1-61

immigration

1866, 7-283

before Civil War, 7-241, \*242, 243, 244

inspection at Ellis Island, 7-\*338

Irish immigrants after 1847, 6-160

"quota" system, 7-337

Immigration Service, 7-378

Indians, treatment of, 7-280; *see also* Indian reservations and *subhead* Indians *under names of states*

industries, 7-343-F; *see also below* products and industries

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**United States—continued**

- insular (island) possessions, 8-†455-76**
  - Pacific islands, 8-†455-461; 5-522, 528; 7-297, 300; 8-471
  - Philippine islands, 5-†561-70, 522; 7-300**
    - Independence bill, 5-569
    - purchase, 5-569
  - Porto Rico, 8-468-70**
  - smallest islands, 8-†463-67**
  - West Indies, 7-51, 53, 58, 62, 297, 307
    - protectorates, 7-56, 57, 58
  - see also possessions below*
- Interior, Department of the, 7-377
- Virgin Islands governed by, 8-467
- irrigation, 10-†542-44, †539, \*541; 7-455
- Justice, Department of, 7-378
- labor, *see under* United States, economic conditions
- Labor, Department of, 7-381
- Liberty Bonds issued by, 7-529
- libraries, 10-555-62
- Lighthouse service, 7-488-B
- literature, *see* American literature
- maps, 7-595, 591
  - showing growth of territory, 1783-1853, 7-\*206
- for state maps see* Contents Volume 8
- Marine corps, *see* United States Marine corps
- merchant marine, number of, 10-232
- migration after 1763, 7-231
- monuments
  - historical, 7-†411-14
  - national; caves, caverns, cliff dwellings, 7-†416-21**
  - see also subhead monuments under each state*
- music and musicians, 12-257, †321
- national parks, 7-†404-9; *see also* subhead parks under names of states**
- Naturalization Service, 7-378
- navy, *see* United States Navy
- oldest inhabited town (?), 8-255
- Pan-American Union, 5-518
- Patent Office, 7-381
- people, 7-343-F
- physical features, 7-343-C
  - mountains, 1-25, 27
  - rivers and waterways, 10-267-68; 7-343-C;
    - see also names of principal rivers, as* Mississippi; Ohio
  - list, 10-255
  - see also subhead physical features under names of various states*
- politics, *see* United States government
- ports, inland, 10-267-68
- possessions or dependencies, 8-†9-16-B, †455-70; list, 7-343-F; *see also above* insular possessions**
- Post Office Department, 7-378, 400; 10-84, †89-92

**United States—continued**

- presidents, 12-456-B-456-E; 7-358, 364, 365, 373, 375**
  - first to meet a sovereign, 12-\*551
  - wives of presidents, 12-†558-64; 9-\*15
  - see also names, as* Jackson, Andrew
- products and industries, 7-343-F
  - cotton industry, 9-29
  - minerals, 7-343-E; 2-97; 9-389, 393, 408, 412, 416, 418, 419, 422, 433, 438, 450, 456
  - textile industry, 9-29
  - wool growing, 9-81
  - see also subhead products and industries under each state*
- prohibition, 7-335, 341
- public buildings in Washington, *see* Washington, D. C.
- racism, 7-33-N
- Reclamation Bureau, 10-531
- religions, 7-343-F
- Repeal, 7-336
- rivers and waterways, *see above under* physical features; *see also subhead rivers under various states and also names of important rivers, as* Mississippi; Ohio
- roads, 10-146-48, 152-56
- safety regulations, 2-425
- Shipping Board, 7-332
- slavery, *see* Slavery
- sports
  - athletic prowess, 14-472
  - baseball invented in, 14-508
  - basketball invented in, 14-484
  - boat racing, 14-533
  - fencing, 14-514
  - football, 14-\*517
  - golf, 14-494, 498
  - lacrosse, 14-493
  - polo, 14-525
  - tennis, 14-470
  - winter sports, 14-483, 519, 521, 524
  - yacht racing, supremacy in, 14-†527-30
- State Department, 7-373-74
- state histories, *see* Contents Volume 8
- taxation, *see* Taxation, United States
- theater and drama, 13-354-55; 12-332
  - moving pictures, 10-†502-03, 506-07, †512-A-B
- time belts, 10-†472-73
- trade
  - after Civil War, 7-288
  - Australia, 10-240
  - Brazil, 10-241
  - Canada; trade treaty, 7-29
  - China, 10-264
    - opening of trade, 5-332, 333
  - colonial period, 7-123, 157-59, 162
  - Cuba, 7-295
  - early republic, 10-146, 172; 7-214, 215, 231
    - before Civil War, 7-258
  - clipper ships, 10-172
  - Embargo Act, 7-209

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**United States**, trade, early republic—*continued*  
 New Orleans, 13-<sup>\*</sup>391  
 tariff disputes, 7-178, 194  
 goods exchanged with Orient, 10-242  
 interdependency of, 7-565 fol.  
 Japan, opening of, 5-360-61  
 merchant marine, number, 10-232  
 reciprocal trade with South America, 5-518  
 transportation  
   air, 10-313, 315, 317, 320, 322  
   automobile, 10-<sup>†</sup>278-81  
   water, 10-<sup>†</sup>220 fol.; 7-241, 242  
     clipper ships, 10-172  
     "Fulton's Folly", 10-217-18, 220  
     ketch, 10-<sup>\*</sup>167  
     river travel, 10-267-68; 7-206, 214-15,  
       <sup>\*</sup>218, <sup>\*</sup>247  
     square-rigged merchant vessel, 10-<sup>\*</sup>171  
 canals, 10-<sup>\*</sup>269, <sup>†</sup>270-74  
 country unified by, 7-<sup>†</sup>304  
 early land, 10-<sup>\*</sup>142, <sup>†</sup>146-48; 7-230, <sup>\*</sup>231,  
   <sup>†</sup>232-33  
   sedan chair, 10-<sup>\*</sup>134  
 highways, 10-153-56  
 iron ore, 9-<sup>\*</sup>399, 408  
 locomotives and railways, 10-<sup>†</sup>181-83, 185,  
   <sup>†</sup>188 fol.; *see also* Railroads, *subhead*  
     United States  
 logs and lumber, 9-<sup>\*</sup>249, <sup>\*</sup>256  
 modern, 10-<sup>†</sup>198  
 oil, 9-<sup>\*</sup>450  
 opening of highways, canals, etc., 7-277,  
   241; 10-148  
 submarine, 10-<sup>†</sup>307, 308  
**Treasury Department**, 7-374-77  
 Alexander Hamilton, first secretary of, 12-  
   509  
 coin storage, 7-<sup>\*</sup>504, <sup>\*</sup>524  
 Independent, or Subtreasury, System devised,  
   7-228  
**Public Health Service**, 7-423  
 vegetation, 7-343-E  
 vice-presidents, 12-456-F-456-G  
 volcanoes, active, 7-407  
 war debts, 7-339, 340  
   reduced for Italy, 6-314  
**War Department**, 7-476, 479-D  
**War Industries Board**, 7-324, 331  
**War Labor Board**, 7-332  
**weather**  
   hours of sunlight, 1-200  
   rainfall, 1-254, <sup>\*</sup>255; 2-196-97  
   rainmaking, 10-<sup>\*</sup>245, <sup>\*</sup>247, <sup>\*</sup>249  
   winds, 1-232  
**Weather Bureau**, 1-<sup>†</sup>274-78; 7-380; *see also*  
   Weather Bureau, U. S.  
**wild-life refuges**, 4-517; *see also subhead*  
   reservations under names of states  
 woman suffrage, 7-244, 336; 12-572  
**Women's Bureau**, 7-381

**"United States," ship**, 7-203  
**United States Air Force**, 7-<sup>†</sup>479-F-481  
 planes, 10-<sup>\*</sup>328-S, <sup>†</sup>368-C-F  
**United States Army**, main article, 7-<sup>†</sup>472-79-E  
 anti-aircraft (AA) guns, 7-<sup>\*</sup>475  
 armored force, 7-479-A, <sup>\*</sup>472  
 artillery, 7-<sup>\*</sup>475, 477-78  
 cavalry, 7-477-78  
 coast artillery, 7-478  
 Continental army, 12-<sup>†</sup>475  
 demobilization of fighting forces after World  
   War I, 7-331  
 engineers, 7-478, <sup>\*</sup>479  
 General Staff, 7-476  
 infantry, 7-476-77  
 Missouri mule, 8-210  
 National Guard, 7-474  
 officers given rank of permanent general, 12-555  
 organization, 7-475-76, 479-D  
 Pentagon Building, Washington, 7-<sup>\*</sup>373  
 personnel training, 7-479-A  
 President commander of, 7-475  
 rangers, 7-479-A  
 Regular Army, 7-474, 475, 479-D  
 reserves, 7-474  
 schools, 7-479-B-D  
 signal corps, 7-478-479  
 three forces, 7-474  
 training camp, 7-<sup>\*</sup>476  
 uniforms, 7-<sup>\*</sup>473, <sup>\*</sup>477  
 used in labor disputes, 7-290, <sup>†</sup>333  
 weapons and equipment, 7-477-78  
 War Department, 7-475-76, 479-D  
 war service, 7-475  
 West Point Military Academy, 7-<sup>†</sup>479-B-E  
 Women's Army Auxiliary Corps, 6-<sup>\*</sup>521  
**United States Bank**, *see* Bank of the United States  
**United States Commissioner of Fish and Fish-**  
**eries**, 7-467  
**United States Constitution**, text, 7-184-90, 356,  
 358, 362, 368  
 Amendments, 7-368-70, 188-90 (text)  
   Bill of Rights, 7-199, 334, 368  
 debates over; compromises, 7-179  
 early interpretations, 7-192  
 fight for adoption, 7-182; 12-468, 478, 509  
 housed in library of Congress, 10-555  
 provisions, 7-179-81, 363-66, 379  
 Rhode Island's ratification, 8-345  
 signers of, 7-188  
 signing, 7-<sup>\*</sup>176, <sup>\*</sup>354  
 state rights guarded, 7-383  
**United States foreign relations**  
 Alaskan affairs, 7-28; 8-12, 14  
 Canada, 7-28  
   tariff agreements, 7-27, 29  
 Central America, 7-47, 48  
 China; Boxer Rebellion, 7-301  
 Cuba, 7-56, 60, 297

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**United States foreign relations—continued****England**

- boundary dispute, 8-153
- during eighteenth century, 7-196, 197
- during early nineteenth century, 7-208, 210
- during Civil War, 7-258
- Oregon question, 7-234, 236
- South American problems, 7-289, 290; 5-517

**France**

- during and after French Revolution, 7-195, 198
- in Mexico, 7-86

**Germany; dispute over Samoa, 7-289****"good neighbor" policy, 7-343****Haiti, 7-†374****Hawaii, 8-460****Japan, 5-360, 364****League of Nations, 12-552, 553; 7-328****Liberia, 5-472****Mexico, 7-87, 316; 8-379; 12-550****Nicaragua, 7-47****Russia, 6-442****South America, 5-506, 517, 518****United Nations, 6-552-55****United States government, 7-†361-81****ambassadors, 7-374****aristocracy *versus* democracy, 7-195-200, 226, 1786, 7-179****Andrew Jackson, 7-222****Hamilton and Jefferson, 7-192-93****big business and politics, 7-281, 282, 292, 312****cabinet, 7-370****city government, 7-†391-402****civil service system, 7-373****common law, 7-386****Congress; powers and duties, 7-357, 361 fol.****Articles of Confederation, 7-175, 179, 362****division into two parts, 7-363****during early years of republic, 7-176, 361-62****House of Representatives, 7-363, †367****law making, 7-363, 364, 367****relations with president, 7-365****Senate, 7-364, 365****Supreme Court's power over, 7-367****text of Constitution concerning, 7-184-86****constitution, *see* United States Constitution****consular offices, 7-374****county government, 7-386, 388, 389****democracy's growth****before Civil War, 7-177, 204, 223, 228, 244****in twentieth century, 7-305, 312; 12-548, 549, 552****departments and their work, 7-370, 373-81;*****see also names of the departments under United States, as Commerce, Department of******of; Labor, Department of*****diplomatic officers, 7-374****division into three equal powers, 7-357, 367****executive functions, 7-357, 369****farmers' uprising; Populist party, 7-291****United States government—continued****finances; budget system, 7-374-77****foreign affairs, 7-373****free-silver and Big Business, battle over, 7-292****internal affairs, 7-377-81****judiciary, 7-358, 366****legislative, *see above*, subhead Congress****national defense, 7-377****political and social reform in Theodore****Roosevelt's administration, 7-308-12****political parties, 7-366, 370-72; *see also* Parties, Political****president****duties and powers, 7-358, 364, 373, 375****how chosen, 7-365****representatives, how chosen, 7-363, 367****spoils system, 7-372****state government, 7-176, †383-89****vice president, 7-366****Virginia's part in, 8-412****United States history, main article, 7-†110, 343****(*see also* Contents Volume 7 for list of chapter headings)****biographies, historical, 12-456-554****presidents and vice-presidents, brief sketches, 12-456-B-456-G****presidents' wives, 12-558-64****periods****exploration and colonization, 7-†121-41****Spanish exploration, 7-119****English exploration and settlement, 13-480; 7-141-43****French exploration, 7-135-41****French and Indian War, 6-†79, 80; 12-474; 7-†141, 143****relations with England, 7-126, †157-62*****see also* American colonial life and history****Revolutionary War, 7-11, †167-70; 6-81; 12-†484-87****Washington's part in, 12-†475-78; 7-†169 fol.****aid given by Lafayette and other foreigners, 12-†450-56*****see also* Revolutionary War****early years of republic, 1783-1800, 7-†192-200****American Federation, 7-361****Declaration of Independence, 12-503 fol.; *see also* Declaration of Independence, U. S.****beginning of a nation, 7-†175-82, 361****Articles of Confederation, 7-175, 179, 362****Constitutional convention, 7-179, 362****struggle for a strong central government, 7-361-62; 12-509****Franklin's diplomatic services, 12-†466-68****Jefferson's influence, 12-†503-6****Northwest Territory, 7-176****relations with England, 7-196, 197****relations with France, 7-195, 198**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**United States history, periods—continued**

**early years of republic, 1801–1823, 7–†202-11**

Louisiana Purchase, 12–506; 7–204-7, 218; 13–491

Embargo Act of 1807, 7–208

War of 1812, 7–15, \*202, †208-11, 492, 493; 6–90, 91; 12–499-500, 506, 515

Canadian border settlements, 7–15, 19

Monroe Doctrine, 7–86, 211; 5–506, 517, 518

depression after failure of United States Bank, 7–228

**conditions in first half of nineteenth century, 7–†213-44**

westward expansion, 7–†213-16, †230-39, \*276, 277-81; 12–516

gold rush, 9–393; 7–239

problem of annexing Texas, 7–235; 12–516

Mexican War, 7–83, †237

Oregon question, 7–234, 236

**Civil War and its causes, 7–†252-65**

nullification by South Carolina, 12–513, 522

slavery question, *see* Slavery

states' rights, 12–521, 524

seces. ion, 12–521

*see also* Civil War

**Reconstruction period, 7–†267-74**

**"Gilded Age" to 1897, 7–†276-92**

gold rush, 7–\*276, 277

relations with England, 7–289, 290

**Spanish-American War, 7–56, †294-97, 302, 493; 12–†540-41, 555; 6–334**

**imperialism, 7–297-302, 307**

acquisition of Porto Rico, 7–297

purchase of Philippine Islands, 5–569; 7–297

relations with Cuba, 7–297

**conditions in the early twentieth century, 7–†304-12**

Hague conference; Hague Tribunal established, 7–301

**Wilson's administration, 7–†314-28; 12–†549-53**

attitude toward League of Nations, 12–552, 553; 7–328

relations with Mexico, 7–87, 316

**World War I, 7–†315 fol., 331; 6–237; 12–†548 fol; *see also* World War**

**period after World War I, 7–†330-43**

military and industrial demobilization, 7–331

American psychology after World War I, 7–334

attitude toward Communist Russia, 7–334

attitude toward war debts and reparations, 7–339, 340

depression and unemployment, 7–\*330, 339

**Roosevelt's administration, 7–340-343**

the New Deal, 7–341-A-342

**United States history, periods—continued**

**World War II and after, 7–343-A-B**

Marshall Plan, 6–562-63

*see also under names of presidents, and Index to World War II, 6–493*

**state histories (and possessions), *see* Contents Volume 8**

**United States Intercollegiate Lacrosse Association, 14–493**

**United States Lawn Tennis Association, 14–470**

**United States Marine Corps, main article, 7–†490-93**

assault on Tinian, 7–\*490

at Guadalcanal, 6–\*536

Haiti, 7–58, \*374

Nicaragua, 7–47

in Haiti and Nicaragua, 12–456-D

organization, 7–491

under Navy, 7–485

war service, 7–493

women's auxiliary corps, 6–\*521

**United States Military Academy, West Point, 7–†476-79**

appointments, 7–479

famous graduates, 7–478

**United States Naval Academy, Annapolis, 7–†488-C-D**

**United States Navy, main article, 7–†482-89**

airplanes, 7–487-88-A

bomb sight, Norden, 7–487

fighting craft, 7–†482-86

development and growth of fighting fleet, 7–484

first frigates, 7–203

submarines, 10–\*306, †307, 310

types of ships, 7–485

Guantanamo rented for naval base, 7–60

islands controlled by, 8–463, 465, 466

maneuvers, 7–488-B-88-C

Marine Corps under control of, 7–491

navy yard, 7–487

markings of navy planes, 10–\*312

organization, 7–485-86, 489

peace-time activities, 7–488-D

personnel, 7–485-86, 489

president commander of, 7–364, 377

protecting cargo vessels, 7–\*482

schools, 7–†488-C-D

Secretary of the Navy, 7–485, 489

war service, 7–483-84

women's auxiliary organization (the Waves), 6–\*521

**United States of Venezuela, *see* Venezuela**

**United States Reclamation Service, 8–43**

**United States Shipping Board, 7–332**

**United States Steel Corporation, 7–308; 12–566**

**United States Supreme Court Building, 11–\*523**

**"United We Stand, Divided We Fall," quotation, 8–138-B, 212-B**

**Units of measure, *see* Measures and weights**

**Univalves, shellfish, 3–†141-49**

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text

- Universal joints**, of automobile driveshaft, 10-†290
- Universal keyboard**, of typewriters, 10-64
- Universal language**  
 Esperanto, 10-7  
 Latin as, 10-11
- Universal Spider** (Louis XI of France), 6-176
- Universe**  
 chart depicting vastness of, 1-\*179  
 movement, 1-\*286  
 Ptolemaic theory, map, 1-\*101, 102  
 theory of ultimate heat death, 1-351  
 universal gravitation, 1-14  
 what is meant by, 1-102, 176  
*see also entries under Astronomy*
- Universities**, *see* Colleges and Universities;  
*also names of universities, as* Harvard University; North Carolina University of, etc.
- University Hall**, Brown University, 8-\*344
- University Hall**, Ohio State University, 8-\*305
- Unknown Soldier, Tomb of the**, Arlington, Va., 7-270
- Unleavened bread**, 9-240
- "Unswep<sup>t</sup> Dining Room,"** mosaic, 11-58
- Unswep<sup>t</sup> Floor**, mosaic, 12-111
- Unter den Linden**, street, Berlin, 6-218, \*229, \*236
- Untermeyer, Louis**, part in poetical movement, 13-348
- Unterwalden**, canton, Switzerland, member of Everlasting League, 6-247
- "Unto This Last,"** by John Ruskin, 13-238
- Untouchables**, caste in India, 5-369, 387
- Unwin, Mary**, friend of Cowper, 13-213
- "Up from Slavery,"** by Booker T. Washington, 12-570
- Up, Jenkins**, game, 14-150
- Updrafts**, of air, 1-223
- Upecalian rail**, bird, 4-\*103
- Upholstery**, furniture, 12-181, 185, \*189, \*195, \*197
- Upholstery leather**, made by chemical process, 10-546
- Upland plover**, bird, 4-\*116
- Upper Canada**, province, Canada, history, 7-14, 16-18
- Upper Carboniferous period**, 3-27
- Upper case**, printing, 10-58
- Upper (Southern) Kingdom**, Egypt, 5-51
- Upper Klamath Bird Refuge**, 8-332
- Upper Mississippi River Wild Life and Fish Refuge**, 8-446-A  
 Illinois, 8-106-A  
 Iowa, 8-124-A  
 Minnesota, 8-198-A
- Upper Niger**, *see* Niger, Colony of the
- Upper Paleolithic period**, 5-27
- Upper Volta**, colony, Africa, 5-473
- Upright piano**, 12-258-D
- Upsala University of**, founded, 6-397
- Upsom, Arthur**, words to "Hail! Minnesota" by, 8-198-A
- Ur**, ancient city and district, Babylonia  
 antiquities, 5-\*81; 12-†81  
 jewelry, 12-\*117, \*120  
 archaeology, 11-404, \*405; 5-\*11, †12, 14  
 bricks, 11-403, 405; 9-\*378  
 clay tablet, 5-\*78  
 dwellings excavated near, 11-396, 405  
 headdress, 9-\*91  
 lyre, 12-\*206  
 map showing location, 5-\*76  
 temples: ziggurat, 11-24, 404, \*405; 5-\*11, 14
- Ur-Nina**, king of Sumeria, 5-80
- Ural Mountains**, Russia  
 glaciers, 3-60  
 highest point, 6-443-A  
 map, 6-600  
 platinum found in, 9-422
- Ural River**, in Southeastern Russia  
 length, 10-253  
 map, 6-601; 5-580
- Uralo-Altai languages**, group spoken in Asia, 5-336-D
- Urania**, Greek muse of astronomy, 14-412; 12-\*205
- Uranium**, chemical element, 9-425  
 and radium, 1-43  
 atomic weight, 1-474, 555  
 Becquerel's experiments, 1-283  
 deposits, 7-29-X; 9-\*424  
 symbol, atomic no. and wt., 1-\*551
- Uranus**, god, 1-155
- Uranus**, planet, description, 1-157-58; table, 1-106  
 discovered by Herschel, 13-404  
 place in solar system, color plate, 1-98; table, 1-106  
 relative size, 1-\*16
- Urban I**, bishop of Rome, converts Valerian, 12-210
- Urban II**, pope, relation to First Crusade, 5-281
- Urbana, Ill.**, university at, 8-\*95
- Urbino, Frederigo, Duke of**, painting by Piero della Francesca, 11-\*139, 143
- Urbino, Duke of**, pottery, 12-58
- Urchins**, *see* Sea urchins
- Urea**, ammonia changed into, 2-367  
 drained by kidneys, color plate, 2-\*374  
 in sweat, 2-367; in plastics, 10-553
- Ureter**, of kidney, 2-\*366
- Urey, Dr. Harold**, scientist, 1-558-D
- Urga**, sacred city of Mongolia, 5-437
- Urgel, Bishop of**, protection of Andorra by, 6-468
- Uri**, canton, Switzerland, member of Everlasting League, 6-247
- Urinal secretion of body**, 2-366, 367
- Urquhart, Sir Thomas**, 10-6
- Urraca**, queen of Castile, 6-338
- Ursa Major**, constellation, *see* Great Bear
- Ursa Minor**, constellation, *see* Little Bear
- Ursula, Saint**  
 story of, in Carpaccio's paintings, 11-174

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Ursula, Saint—continued**

- Virgin Islands named for, 7-62
- Urucu**, dye used by Indians, 9-305
- Urucúry**, oil, 9-190
- Uruguay**, country, So. Amer., description, 5-513-14; general data, 5-518-G
  - area, 5-518-G
  - cattle and sheep raising, 5-514; 9-329, 81
  - climate, 5-518-G, 518-B
  - education, 5-513, 515
  - flag, color plate, 14- following 570, no. 69
  - Garibaldi's fight for freedom of, 12-445
  - government, 5-518-G
  - hides, 5-514; 9-\*71
  - history, 5-507, 513
  - location, 5-518-G
  - map, 5-605
  - people, 5-518-G
  - physical features, 5-518-G
- Uruguay**, river, So. Amer., map, 5-604
- Uruk**, ancient Sumerian city, 5-80
- Urus** (Bison), animal, 6-162-D
- Urtu**, snake, 3-\*493
- Use**, shrine, Japan, 5-344
- Ushabti**, Egyptian figurine, 12-55
- U.S.S.R.**, *see* Union of Socialist Soviet Republics
- Usury**, practiced by Jews, 5-135
- "**Utah**," meaning, 8-396-A
- Utah**, state, U. S., description and history, main article, 8-†389-95; general data, 8-396-396-B
  - agriculture, 8-391
  - area, 8-396
  - capital and capitol building, 8-\*389
  - charities and correction, list, 8-396
  - cities, towns, list, 8-395, 396-B
  - climate, 8-391, 396
  - counties, list, 8-396-B
  - education, 8-395
    - institutions of higher learning, list, 8-396
  - flag, 8-396-A
  - Great Salt Lake, 8-390, 391; 1-†44
  - history, 8-392-94
    - admitted to Union, 8-393
  - holidays, 8-396-A
  - Indians, 8-393; 7-93, \*105
    - reservations, 8-396-A
  - interesting facts, 8-396-A
  - location, 8-396

**Utah—continued**

- map, 8-550
  - on United States map, 7-594
- monuments, 8-396-A
  - Arches, 7-419
  - cliff dwelling, 7-421
  - Dinosaur National Monument, 7-421
  - Natural Bridges, 7-419, \*420; 1-96
  - Timpanogos Cave, 7-417
  - Mormon Temple and Tabernacle, 8-\*390
- motto, 8-396-A
- name, 8-396-A
- nicknames, 8-396-A
- parks, 8-396-A
  - Bryce Canyon, 8-396-A; 1-\*18, \*38
- physical features, 8-390, 391, 396
- political facts, 8-396
- products and industries, 8-†394-95; 9-\*164
- reservations, game and bird, 8-396-A
- rivers, 8-396
- salt beds, 9-411, 413
- Salt Lake Valley, 7-\*244
- state bird, 8-396-A
- state flower, 8-396-A
- state song, 8-396-A
- transportation, 8-395
  - included in Mormon State, "Deseret," 8-393
- Utah, Territory of**, 8-393
- "**Utah, We Love Thee**," song, 8-396-A
- Utah Lake**, Utah, 8-396
  - discovery, 8-392
- Ute Indians**, 8-392
  - Colorado reservation, 8-52-B
  - phrase describing their people, 8-396-A
- Uten**, Egyptian weight, 10-371
- Uther, King**, in Arthurian romances, 14-378
- Utica**, N. Y., industries 8-281
- Utilitarian Society**, 13-239
- "**Utilitarianism**," by J. S. Mill, 13-239
- Utilities**, public, *see* Public Utilities
- "**Utopia**," by Sir Thomas More, 13-147
- Utopian socialism**, 7-244
- Utrecht**, Holland, 6-355
- Utrecht, Treaty of**
  - England's gains, 6-75
  - France's losses, 6-184; 7-7
- Uzbek Republic, U.S.S.R.**, 5-435; 6-443-B
  - map, 6-602



- V-2 rockets**, 10-368-F, \*365; 1-218
- Vaal River**, Union of South Africa, 5-491-B
- Vaca**, Alvar Nuñez Cabeza de, *see* Cabeza de Vaca
- Vaccination**, 13-366, 368
  - introduced into England, 13-184
- Vaccine**, produced from injected virus, 2-13
- Vacuole**, of plant cell, 2-\*7, 8
- Vacuole**, contractile, in animal cell, 2-\*280

- Vacuum**, main article, 1-†452-56
  - heat in, 1-4
  - in electric lamp, 1-525, 526
  - partial; how to create, 1-456
  - poorest heat conductor, 1-397
  - poorest sound carrier, 1-447
  - will not diffuse light, 1-\*177
- Vacuum cleaner**, principle of operation, 1-463

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Vacuum tank**  
 automobile, 10-†283  
 in sugar factories, 9-115
- Vacuum tube**, 1-514, †561-64, †566  
 radar, 1-†566-68  
 radio, 10-118, 120-D  
 sound pictures, 10-504, 506  
 television, 10-124
- Vaduz**, capital of Liechtenstein, 6-467
- Vail, Alfred**, aids Morse's telegraphic experiments, 10-96
- Vailima**, home of Robert Louis Stevenson, 13-265
- Vaishyas**, caste in India, 5-368
- Val**, lace, 12-172
- Valais**, canton, Switzerland, scenery, 6-†251
- Valdemar I, the Great**, king of Denmark, 6-410
- Valdemar II, the Victorious**, king of Denmark, reign, 6-410
- Valdemar Atterdag**, king of Denmark, 6-†411
- Valdemar**, king of Sweden, 6-394, 395
- Valdes, Pedro de**, surrenders to Drake, 12-†404
- Valdivia, Pedro de**, founds Santiago, 5-498
- Valencia**, Ireland  
 mean temperature in January, 6-162-B  
 terminus of Atlantic cable, 10-103
- Valencia**, Spain  
 commerce, 10-259  
 map, 6-591, F3
- Valenciennes**, France  
 laces, 12-†165, 172  
 siege, 12-†412
- Valentine State**, nickname for Arizona, 8-24-A
- Valentine's Day**, 14-579, \*581
- Valera, Eamon de**, *see* De Valera
- Valerian and St. Cecilia**, 12-210
- Valhalla**, home of Scandinavian gods, 6-377  
 duties of the Valkyrie, 14-429
- Valjean, Jean**, character in Victor Hugo's "Les Misérables," 2-290
- "Valkyrie," yacht**, 14-530
- "Valkyrie, The," opera** by Richard Wagner, 12-296
- Valkyries**, mythological warrior-maids, 6-†370, 377; 14-†429
- Valley**, in physiography, 1-25  
 apple skin theory, 1-19  
 Colorado, 8-52-A  
 Coosa, 8-2  
 cut by Meuse River, 6-351  
 cut by streams, 3-3  
 formation in West Virginia, 8-431  
 Great Appalachian, 8-2  
*see also names of valleys, as* Virginia, Valley of
- Valley Forge**, Penn., in Revolutionary War  
 Lafayette at, 12-453  
 Steuben drilling soldiers, 12-†454  
 Washington at, 12-†475
- Valley of Ten Thousand Smokes**, Alaska, 7-416; 8-16-B
- Valley quail**, 4-†143
- Valois, house of**  
 France ruled by, 6-170  
 quarrels with Hapsburgs, 6-176
- Valve**, of heart, 2-373
- Valve**  
 Diesel engine, 10-†291  
 safety: steam engine, 10-397  
 steam engine, 10-397, 398, 401  
 steam radiator, 1-†479, 480
- Valve cage**, shown in diagram of Diesel engine, 10-†276
- Valve horn**, 12-258-B
- Van Buren, Hannah Hoes** (Mrs. Martin Van Buren), gown worn by, 9-†15
- Van Buren, Martin**, president of the U. S., 12-456-E  
 panic during administration of, 7-228  
 vice-presidency, 12-456-G
- Van Cortlandt**, old New York name, 8-275
- Van der Weyden**, *see* Weyden, van der
- "Van Dief, Master," painting** by John Hoppner, 11-†303
- Van Diemen's Land**, *see* Tasmania
- Van Drebbel, Cornelis Van**, Dutch inventor  
 builds under-water boat, 10-308  
 thermometer made by, 1-†389-90
- Van Dyck, Sir Anthony**, life and art, 11-†216, †227-28  
 method of work, 11-294  
 paintings, 11-†216, †225-26  
 "Baby Stuart," 11-†225  
 Charles I, 11-†216  
 Charles I and queen, portraits, 11-†216  
 children of King Charles I, portrait, 11-†226  
 heads of children, 11-†226
- Van Eyck, Hubert**, *see* Eyck, Hubert van
- Van Ghent, Joos**, *see* Ghent, Joos van
- Van Gogh, Vincent**, *see* Gogh, Vincent van
- Van Rensselaer**, old New York name, 8-275
- Van Tierhoven, Cornelius**, signing deed, 7-†391
- Van Twiller, Wouter**, governor of New Netherland, 8-272
- Van Voorhis, Daniel**, teapot by, 12-†91
- Vanadium**, element, 9-403  
 symbol, atomic no. and wt., 1-†551  
 where mined, 5-518-B
- Vancouver, George**  
 Hawaii, 8-458  
 Pacific coast of North America, 7-19; 8-12
- Vancouver**, island, Canada  
 map, 7-592  
 united with British Columbia, 7-19  
 world trade, 7-29-V, 29-W
- Vancouver, Wash., city**, wheat export, 10-268
- Vandals**, migrations, 5-268  
 in Spain, 6-319  
 invasion of Western Africa, 13-533  
 Rome sacked by, 5-†262, 268
- "Vandals of the Reformation," picture**, 6-†213
- Vandenburg, Arthur**, senator, 7-343-B
- Vanderbilt, Cornelius**, enterprise: builds New York Central, 10-190

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



- Vanderbilt, William H.**, 7-282  
**Vanderbilt University**, Nashville, Tenn., 8-369  
**Vandiver**, Willard, quotation, 8-212-B  
**Vanilla**, plant and flavor, 9-†207-8  
**Vanillin**, artificial vanilla, 9-208  
**"Vanity Fair,"** by W. M. Thackeray, 13-241  
**"Vanity of Human Wishes, The,"** by Samuel Johnson, 13-193  
**Vaphio cup**, 12-82, \*83; 11-32  
**Vapor, water**, *see* Water vapor  
**Vardar**, valley in Yugoslavia, 6-290-B  
**Varèse**, Edgar, 12-257  
**Vargas, Diego de**, Spanish conqueror, 8-259  
**Variable current**, electrical, 1-516  
**Variable time fuse (VT)**, 10-368-A  
**Variable stars**, 1-174; 13-404  
**"Variation of Animals and Plants under Domestication, The,"** by Charles Darwin, 13-437  
**Varied thrush**, bird, color plate, 4-\*24  
**Varius**, Virgil's writings willed to, 13-49, 50  
**Varna**, Bulgaria, port on Black Sea, 6-368-A map, 6-594  
**Varnishes**  
   heat resistant, 10-553  
   oil glazes for preserving paintings, 11-198  
   soy bean oil used in, 10-546  
   tung oil used in, 10-546  
   turpentine used in, 9-313  
**Varrenvanger, Jacob Hendricks**, portrait, 7-\*391  
**Varsity crews**, boat racing, 14-†530-33  
**Varus, P. Quintilius**, defeated by Germans, 5-263; 6-204  
**Varying hare**, animal, 4-386  
**Vasa, Gustavus**, *see* Gustavus I, king of Sweden  
**Vasari, Giorgio**, painting by, 11-\*482  
**Vasco da Gama**, *see* Gama, Vasco da  
**Vascular bundle**  
   leaf, 2-24, \*26  
   monocotyledons, 2-\*144  
   stem, 2-\*31, \*132  
**Vascular system**, of leaves, 2-23 fol.  
**Vascular tissue**, 2-\*30, \*48  
**Vase rug**, 12-148  
**Vaseline**, by product of petroleum, 9-456  
**Vases**  
   gold, by Tiffany, 12-\*90  
   restoration of ancient, 12-\*56  
   *see also* Pottery  
**Vases**  
   cloisonné, 12-\*66, \*68  
   Cretan, 12-†48  
   engraved glass, 12-†38  
   Etruscan, 5-\*191; 12-\*15  
   forms, 12-50  
   glass, 12-\*26-29, \*37, †38  
   gold, 12-\*83  
   Greek, 12-46, †49, 52-54; 5-\*158, \*190; 11-\*35, \*36  
   Mycenaean, 12-\*47, \*48; 11-\*33  
   painting, 11-†35-36, \*49, 50  
   Peruvian pottery, 5-\*495  
   porcelain, 12-\*57  
**Vases—continued**  
   Portland vase, 12-\*29  
   silver, 12-\*80  
**Vasili III**, grand prince of Moscow, 6-427  
**Vasoconstrictors**, nerves, 2-379  
**Vasodilators**, nerves, 2-379, 381  
**Vasomotor center**, of brain, 2-379, 380  
**Vassal**, in feudal system, 7-351  
**Vatican**, palace of pope, Rome, 11-\*486  
   door, 12-\*5  
   Sistine Chapel paintings, 11-\*157, \*158, 162, 167  
**Vatican City**, papal state, Rome, 6-†466, \*467-68, 315  
**Vatican Library**, Rome, 10-556  
**Vault**, in architecture, 11-455, 462, \*463  
**Vault**, of bank, 7-\*520  
**Vecchio, Ponte**, Florence, 11-\*483  
**Vecht River**, Netherlands, 6-355-A  
**Veck, Charles**, sculptor, 11-364  
**Vedas**, Hindu writings: Rig-Veda, 5-368, 369  
**Veddahs**, primitive people, in Ceylon, 5-387-B  
**Vedder, Elihu**  
   paintings  
     "Lost Mind, The," 11-\*371  
     "Questioning of the Sphinx, The," 5-\*47  
**Veery**, bird, 4-54  
   Massachusetts' Women's Clubs vote as state bird, 8-176-B  
   nest building and breeding, 4-55  
**Vega**, star, 1-178  
   star maps  
     July and August, 1-178-G  
     May and June, 1-178-F  
     Nov and Dec, 1-178-K  
     Sept and Oct, 1-178-I, 178-J  
**Vega Carpio, Lope Félix de**, life and dramas, main article, 13-77-79  
   called "father of the Spanish theater," 13-79  
   work for Valencia theater, 12-329  
**Vegetable dyes**, 9-304-7  
**Vegetable ivory**, sources, 2-255-56; 9-51  
**Vegetable oils**, uses, 9-312; 10-546-47  
**Vegetable sheep**, plant, 2-\*261  
**Vegetables and vegetable gardening**, main article, 9-†147-54  
   breeding, 2-233  
   Burbank's discoveries, 13-416, 417  
   canning, 9-\*228, 229, 231  
   earliest known, 9-148  
   flowers used as food: cabbage family, 9-148, \*149  
   fruits eaten as vegetables, 2-256  
   how to make animals from, 14-†13, †14  
   most important vegetables, 9-150  
   potatoes, 9-†142-45  
   provide bulk in diet, 2-367  
   truck gardening, 9-†150-54, \*148  
   vitamins, 2-365  
   why necessary to health, 9-147  
**Vegetation**, *see* Plants

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Vehicles**

earliest used

Indian tra<sup>o</sup>is, 10-128, 129

sedan chair, 10-130, \*132, \*134

s<sup>j</sup>eds, 10-130, \*131, \*132, \*133

first steam carriages, 10-†175-83, 277, \*280

first use of wheels, 10-†143-44

*see also names of vehicles, as Carriages; Locomotives; Wagons; and also Transportation***Veii**, ancient town, Etruria, captured by Romans, 5-192, 205**Veils**, worn by Mohammedan women, 5-\*71**Veins**, blood, 2-373 fol.

color plate, 2-\*327

hepatic, 2-378

joined to arteries by capillaries, 2-279

jugular, 2-\*335, 376

of bones, 2-345

of brain, 2-\*387

of head, 2-\*378

of heart, 2-\*374

of leg, 2-\*376

popliteal, 2-\*396

portal, 2-374

pulmonary, color plate, 2-\*279, \*375

structure, 2-375

venae cavae, 2-\*371, 373, color plate, \*374

**Veins**, leaf, 2-23, 25**Velasco, Luis de, Count of Santiago**, the Emancipator, viceroy of Mexico, 7-80**Velasquez, Diego**, governor of Cuba, relations with Cortes, 13-\*469; 7-73, 76**Velasquez, Diego de Silva**, life and art, 11-†247-57, \*241

greatness as portrait painter, 11-252, 257

made court painter, 11-251

paintings

compared with Goya's, 11-309

"Don Balthazar Carlos," 11-\*250, \*253

Joseph's coat of many colors, 11-\*249

"Maids of Honor, The," 11-\*251

of Aesop, 13-\*42

"Philip IV, Old," 11-\*253

"Philip IV Young, in Black," 11-\*248

Pope Innocent X, portrait, 11-\*253

self-portraits, 11-\*251, \*253, 254

Rubens' kindness to, 11-226

style in composition, 11-254, 256

**Vellum**, source and uses, 9-†274**Velvet fiddler crab**, 3-183**Velvet sponge**, 3-85, 87**Venae cavae**, chief veins, 2-\*371, 373, color plate, \*279**Venation of leaves**, types of, 2-25**Vendetta** (blood feud), in Corsica, 6-472**Veneered furniture**, 12-\*177, 179; 9-258**Veneti**, people, use of iron, 12-4**Venetian glass**, 12-\*30, †31-34**Venetian laces**, 12-164, 166**Venetian painting**, main article, 11-†171-88**Venezuela**, country, So. Amer., description and history, 5-517-18; general data, 5-518-E

birds; herons, 4-107

climate, 5-518-E

economic conditions, 5-518

flag, color plate, 14-following 570, no. 70

government, 5-518-E

history, 5-500, 504, 507, 517

Bolívar's War of Liberation, 12-437

boundary arbitration, 7-290

Indian houses, 7-\*101

location, 5-518-E

map, 5-602

merchant marine, 10-232

oil, 5-517; 9-\*449

people, 5-518-E

physical features, 5-518-E

sections, 5-518-E

trade, 10-241

**Venezuelan Guiana**, 5-518-E**Venice**, Italy, 6-\*307; 11-\*171

architecture, 11-484, †486-87

art, 11-†171-88

canals, 6-†314

city-state, 6-301, 302; 11-446

Council of Ten, 6-\*307

Doge's Palace, 11-\*455, \*467, \*487; 6-\*303

earliest news letters, 10-74, \*75

gayety, 6-\*292

in the days of her glory, 5-\*297; 11-171

industries, 10-260

glass manufacture, 12-\*30, †31-34

lace making, 12-164

location, 6-315-B

map, 6-588, 102

map of city and vicinity, 6-588

printing center, 10-51

relations with Austria, 6-306, 308, 309

republic, 6-297

Rialto, 10-214

St. Mark's, 11-\*446-49

St. Mark's Square, 11-\*455

pigeons, 6-\*312

ships and trade, 13-445; 10-167

shoe worn, 9-\*54

view painted by Canaletto, 11-\*171

war with Turks, 5-409, 412

wedding to the Adriatic, 6-292; 11-449

**Venice, Gulf of**, Europe, map, 6-588**Venice of the North**, name given Holland, 6-354**Venioles**, growth into veins, 2-375**Venise à réseau**, lace, 12-166**Ventilation**

in mine, 9-\*435

of heated rooms, 10-384

**Ventricles of heart**, 2-372, \*374, \*375

color plate showing circulation of blood, 2-frontispiece

wall between auricles and, 2-\*373

**Venus** (Aphrodite), goddess, 14-409, \*412; 1-147, \*149

aids Hippomenes, 14-453

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Venus—continued**

- and Adonis, 14-442
- and Anchises, 14-\*450
- gives life to Galatea, 14-453
- harsh treatment of Psyche, 14-\*460, 461
- sculptures
  - Aphrodite of Melos, 11-\*51
  - by Canova, 11-\*290
  - by Praxiteles, 11-\*51, 52
  - from Cyrene, 11-\*65
  - Greek relief, 11-†41
  - Medici Venus, 11-\*65
- Venus**, planet, description, 1-†147-49; table giving general data, 1-106
- atmosphere, 1-148
- color plates, 1-facing 145, 98
- place in solar system, color plate, 1-98; table, 1-106
- transit of, 1-\*147 48, 149
  - observed by Captain Cook, 13-489
- relative size, 1-\*16
- Venus de Medici**, statue, 11-\*65
- Venus de Milo**, statue, 11-\*51
- Venus' flower basket**, sponge, 3-†85
- Venus' flytrap**, plant, 2-\*60, 62
- Venus' girdle**, jellyfish, 3-113
- Venus of Chidus**, statue by Praxiteles, 11-\*51, 52
- Venusti, Marcello**, portrait of Michelangelo, 11-\*156
- Vera Cruz**, city, Mexico
  - besieged by pirates, 7-81
  - chapel, 7-\*79
  - founded by Cortes, 13-468
- Vera Cruz**, state, Mexico, map, 7-597
- Verchères, Marie-Madeleine de**, defends Canadian fort, 7-\*5
- "**Verd Mont**," meaning, 8-404
- Verde River**, or **Rio Verde**, Arizona, 8-24
- Verdi, Giuseppe**, life and works, main article, 12-†299-300, 253
- portraits, 12-\*241, \*299
- Verdi, Margarita Barezzi**, wife of Giuseppe Verdi, 12-\*299
- Verdigris** on copper, 9-419
- Verdigris River**, U. S., 8-131; 12-515
- Verdun, Battle of**, 6-201
- Vereeniging, Treaty of**, 5-489
- Vérendrye, Louis-Joseph La**, 7-7
  - and Crowhigh Butte, 8-302-A
  - in North Dakota, 8-299
  - in South Dakota, 8-359
  - memorial, 7-414
- Vérendrye, Pierre Gaultier de Varenne, sieur de la**, biography, 13-†560-62; 7-†7
- Verendrye National Monument**, No. Dakota, 7-414; 8-302-A
- Vergil**, *see* Virgil
- Verkhoyansk, Siberia**, temperature, 1-210; 6-443-A
- Vermeer (Jan van der Meer)**, paintings, 11-268
- Vermiform appendix**, 2-358
- Vermillion, S. Dak.**, university at, 8-359

- Vermillion flycatcher**, bird, 4-136
  - color plate, 4-\*24
- Vermillion Parish**, Louisiana, bird sanctuary, 4-517
- Vermillion Range**, Minn., iron ore, 8-196
- Vermillion Sea**, old name for Gulf of California, 13-487
- Vermont**, state, U. S., **description and history**, main article, 8-†398-403; general data, 8-404-404-A
  - agriculture, 8-398, 401, 403
  - area, 8-404
  - capital and capitol building, 8-\*398
  - cities, towns, list, 8-402-3, 404-A
  - climate, 8-404
  - counties, list, 8-404-A
  - education
    - institutions of higher learning, list, 8-404
    - University of Vermont, 8-\*400
  - flag, 8-404
  - history, 8-399-402
    - admitted to Union, 8-401
    - settlement of, 8-399, 400; 12-495
  - holidays, 8-404
  - Indians, 8-400
  - location, 8-404
  - map, 8-522
    - on United States map, 7-595
  - motto, 8-404
  - name, 8-404
  - nicknames, 8-404
  - physical features, 8-404
  - political facts, 8-404
  - products and industries, 8-402-3
    - maple sugar, 2-\*235; 8-403, \*402; 9-124
  - rivers, 8-404
  - state bird, 8-404
  - state flower, 8-404
  - state song, 8-404
  - transportation, 8-403
- Vermont, University of**, 8-\*400
- Verona, Italy**, ruled by Scala family, 6-299
- Verona, Pisanello da**, *see* Pisanello da Verona
- Veronese Paolo (Paolo Caliari)**, style of painting, 11-188
  - paintings
    - Alexander depicted receiving family of Darius, 12-\*348
    - "Christ among the Doctors," 11-\*183
- Verrazano, Giovanni da**, discoveries, 7-135
  - first to explore New Jersey coast, 8-250
  - New York, 8-270
  - theory of origin of Rhode Island's name, 8-347
- Verrocchio, Andrea del**, style, 11-144
  - paintings, 11-144
    - "Baptism of Christ," 11-\*153
    - Madonna and Child, 11-\*142
  - pupils, 11-144, 152
  - sculptures, 11-144
    - David, 11-\*143
    - the Colleoni statue, 12-\*12, 22

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Versailles, France**

- palaces and gardens, 11-\*233, 239, \*489, 490, 491
- built by Louis XIV, 12-411
- changes made by Louis XV, 11-282
- furnishings, 12-190
- German emperor crowned in, 6-†231
- Louis XIV's bedroom, 11-\*233
- Louis XV's bedroom, 11-\*282
- sculpture, 11-\*231-32

**Versailles, Treaty of, 6-239**

- area awarded Belgium, 6-355-B

**Versailles Peace Conference, 7-327-28**

- Woodrow Wilson's efforts for a just peace, 12-552

**Verse, see Poetry****Vertebrae of spinal column, 2-319, \*320, \*322, \*396****Vertebrates, animals with backbones, definition;**

- classification, 3-†68
- beginnings in Ordovician period, 3-15
- earliest on land, 3-29
- fishes an order of, 3-196
- fossils of earliest, 3-12, 15
- most active, 4-57

**Vertex, of angle, 10-438****Vertical fin, of airplane, 10-\*328-K****Verulam, Francis Bacon, baron, see Bacon, Francis, baron Verulam, viscount St. Albans****Verus, Lucius, colleague of Marcus Aurelius, 5-242****Vervet monkey, 4-253****"Very Beautiful Hours of Our Lady, The," Duke of Berry's picture book, 11-192****"Very Rich Hours of the Duke of Berry, The," book of paintings, 11-†192****Vespasian (Titus Flavius Sabinus Vespasianus), emperor of Rome, reign, 5-238**

- Greek statuary brought to Rome by, 12-16
- siege against Jews, 5-133, 238
- temple of, Rome, 5-\*231

**Vesper sparrow, 4-84, \*85****Vespucci, Amerigo (Americus Vespucius), life, main article, 13-457**

- America named for, 7-117
- discoveries, 13-457; 5-496, 497
- portrait, 13-\*457

**Vest Fiord, Norway, 6-\*382****Vesta (Hestia), goddess, 14-408; 5-204**

- temple of, 11-†430, \*436; 5-\*221
- sacred fire in, 10-334

**Vestal virgins, Roman priestesses, duties and privileges, 5-\*204, \*234, \*238; 11-\*429, 430 and gladiators, 5-\*234**

- carried off by Lithuanian duke, 6-\*461
- house of, 5-\*221; 11-436
- number and period of service, 11-430
- power to pardon, 5-\*238
- sacred fire, 5-204; 11-430
- temple of Vesta; sacred fire, 11-\*430

**Vestibule of ear labyrinth, 2-\*282, 283, \*304****Vesuvius, Mount, volcano, 5-\*260**

- destruction of Pompeii and neighboring towns, 5-238, †257-58; 1-74
- lava field, 1-\*8
- loss of crown, 1-76
- recent behavior, 1-74
- started under ocean, 1-76

**Veta Madre Mine, Mexico, 9-388****Veto**

- Maine, 8-156
- president's power, United States, 7-358, 365

**Vettii, House of the, Pompeii, paintings, 11-\*70****Via Salaria, Roman road, 9-412****Viaducts, Roman, 10-212****Viardot, Pauline, 12-308****Viaud, Louis Marie Julien, see Loti, Pierre****Vibrations**

- earthquake, 1-\*81, 82
- sound caused by, 1-†443-50; 2-\*303, 305

**"Vicar of Wakefield, The," by Oliver Goldsmith, 13-198****Vice presidents of United States, 12-456-F-456-G**

- how chosen, 7-366

**Viceroy butterfly, 3-284****Vick, Henry de, clock made by, 10-464****Vicksburg, Miss.**

- industries, 8-205
- park, 8-206
- temperature, 8-206

**Vicksburg, Battle of, 7-261, 263****Victor Amadeus II, duke of Savoy and Sardinia, 6-303****Victor Emmanuel I, king of Sardinia, 6-\*308****Victor Emmanuel II, king of Italy (and Sardinia), 12-†446; 6-309****Victor Emmanuel III, king of Italy, 6-309****Victoria, queen of England, reign, 6-90, †97-101 coronation, 6-\*97**

- Disraeli a favorite of, 12-441
- empress of India, 6-100; 5-385; 12-441
- gifts to Arthur Sullivan, 12-319
- Koh-i-noor diamond presented to, 9-430
- literature, 6-97
- Mendelssohn playing before, 12-\*287
- message on laying of Atlantic cable, 10-102
- paintings of
  - at eighteen years of age, 13-\*254
  - "Victoria Regina," 6-\*92
- portrait, 6-\*101
- train trip, 10-188
- wedding lace, 12-169

**Victoria, Guadalupe, president of Mexico, 7-82****Victoria, capital of British Columbia, Canada, 7-24, 29-V**

- temperature, 7-33-A

**Victoria, Lake, see Victoria Nyanza, lake****Victoria, state, Australia, 5-554, 558**

- effect of gold discovery, 5-557
- map, 5-601
- member of Commonwealth of Australia, 5-560-L

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Victoria Falls**, Rhodesia, Africa, 5-<sup>\*</sup>486  
 Livingstone's discovery, 13-553  
**Victoria Glacier**, Banff, color plate, 7-<sup>†</sup>23  
**Victoria Island**, Arctic Ocean, maps, 13-502-A, 5-572  
**Victoria Nyanza**, lake, Africa, 5-462; map, 5 576  
**Victoria regia** (water lily), 2-<sup>\*</sup>201  
**"Victoria Regina,"** painting, 6-<sup>\*</sup>92  
**Victorian Age**, 6-97  
**"Victory,"** by Joseph Conrad, 13-274  
**"Victory,"** Lord Nelson's flagship, 6-<sup>\*</sup>88; 12-<sup>†</sup>422  
**Victory Crowning Athena**, 14-<sup>\*</sup>406  
**Victory figure** on Soldiers' and Sailors' Monument, 8-110  
**Victory Loan**, 7-324  
**Victory Monument**, 8-<sup>\*</sup>408  
**Victory of Samothrace**, statue, 11-55, <sup>\*</sup>56  
**Vicuña**, animal, 4-400  
**Vienna**, Austria, 10-259  
 Academy of Sciences planned by Leibnitz, 13-15  
 becomes center of culture and romance, 6-273  
 Hungarian capital set up in, 6-281  
 legislature building, 6-<sup>\*</sup>271  
 location by Lat and Long, 6-265  
 map, 6-386, D2  
 Napoleon receiving keys of, 12-<sup>\*</sup>427  
 Napoleon's conquest of, 6-<sup>\*</sup>267, 268  
 rainfall, 6-265  
 riots in 1927, 6-275  
 Turkish sieges  
 1529, 5-412  
 1683, 6-262, 263  
**Vienna, Congress of (1815)**, 6-<sup>\*</sup>91  
 attitude toward South American revolution, 5-506  
 Austria affected by, 6-268  
 Germany affected by, 6-226  
 treatment of Italy, 6-306  
 treatment of Poland, 6-454  
**Vienna, Peace of**, 1809, 6-197  
**Viet Nam**, Annam republic, 5-429, 430, 430-B  
**"View of Delft,"** painting by Vermeer, 11-<sup>†</sup>268  
**Vigée-Le-Brun**, *see* Le Brun, Marie Anne Elizabeth  
**Vigfusson**, Gudbrand, 6-420  
**"Vigil, The,"** picture, 14-<sup>\*</sup>393  
**Vigilance Committees** in gold rush days, 7-239  
**"Vigilant,"** yacht, 14-530  
**Vikings**, people, description and history, main article, 6-<sup>†</sup>370-77  
 bronze weapons and tools, 12-<sup>\*</sup>16  
 character, 6-374  
 explorations in America, 7-<sup>†</sup>110-12  
 flag, 14-573  
 funeral, 6-<sup>†</sup>376  
 meaning of name, 6-374  
 racial ancestry, 5-268  
 seamanship: power, 6-373, 374; 10-166  
**Vikings-** *continued*  
 ships, 6-<sup>\*</sup>371, 374, 375, 377; 10-<sup>\*</sup>164, 166, <sup>\*</sup>360  
 ship-graves, 6-375, <sup>†</sup>376  
*see also* Scandinavians  
**"Viking's Farewell, The,"** picture, 5-<sup>\*</sup>267  
**"Vikings of Helgeland, The,"** by Henrik Ibsen, 13-87  
**Vikings of the Pacific** (Polynesians), 5-520  
**Villa, Francisco**, efforts of United States to capture, 12-555; 7-316  
**"Village Blacksmith, The,"** by H. W. Longfellow, 13-301, 303  
**"Village Choir, The,"** picture by Thomas Webster, 12-<sup>\*</sup>245  
**"Villain,"** derivation and changes in meaning of, 10-17  
**Villars, Claude Louis Hector de**, duke, at Denain, 6-<sup>\*</sup>183  
**Villeinage** in England, 6-24, 28  
 Peasants' Revolt, 6-32  
*see also* Serfdom  
**"Villette,"** novel by Charlotte Brontë, 13-248  
**Villi** of small intestine, 2-352, 357, 358  
**Villiers de l'Isle-Adam, Philippe Auguste Mathias, Comte de**, 13-100  
**Villoing, Alexander Ivanovitch**, Rubinstein's teacher, 12-311  
**Villon, François**, life and works, main article, 13-<sup>†</sup>104-5  
 statue of, 13-<sup>\*</sup>104  
**Vilmorin**, develops beet sugar, 9-126  
**Vilna**, capital of Lithuania, 6-460  
**V-Mail**, 10-92  
**Vinalhaven Island**, granite quarries, 8-151, 155  
**Vincennes, Ind.**, becomes English territory, 8-111  
**Vincennes, Fort**, 8-111  
**Vincent de Beauvais**, and Louis IX, 6-<sup>\*</sup>169  
**Vinci, Leonardo da**, life and work, 11-<sup>†</sup>149-54, 156  
 aircraft planned by, 11-151; 10-314, <sup>\*</sup>315  
 character, 11-151, 152  
 hands in paintings of, 11-152  
 paintings  
 John the Baptist, 11-<sup>\*</sup>152  
 "Last Supper," 11-<sup>\*</sup>149, 152  
 Lucretia Crivelli?, 11-<sup>\*</sup>151  
 "Madonna of the Rocks," 11-<sup>\*</sup>150, 151  
 "Mona Lisa," 11-<sup>†</sup>154, 156  
 suspects source of pale light, 1-127  
 universal genius of, 11-149  
**Vindhya**, range in India, 5-387-A  
**Vineland**, N. J., important poultry and egg center, 8-245  
**Vines**, tendrils, 2-<sup>†</sup>154-55  
 bridges built of, 9-283  
 longest, 2-263  
 prevent soil from washing away, 7-470  
**Vineyards**  
 Hungary, 6-287  
 banks of Rhine, 7-<sup>\*</sup>350

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Vinland**, dis. by Leif Ericsson; colony, 7-2, 111  
**Vintners' Company**, 9-359  
**Vinyls**, 10-552  
**Viol**, musical instrument, 12-222, 224, \*226  
**Viola**, musical instrument, 12-258, 226, 233  
**Viola d'amore**, musical instrument, 12-\*226  
**Viola da gamba**, musical instrument, 12-226  
*Viola pedata*, flower, 8-196-A  
**Violet**, color, color plate, 1-434, 438  
     dye, 9-447  
**Violet** (*Violet*), flower, 2-183  
     generic name, 2-183  
     self-pollinated, 2-108  
     state flower of  
         New Jersey, 8-252-A  
         Rhode Island, 8-347  
     Wisconsin's state flower, 8-446-A  
**Violin**, musical instrument, 12-258, †224  
     ancestors of, 12-222, 224, \*226  
     dependent on friction, 1-321  
     in string quartet, 12-233  
     sounding box, 1-440  
**Violin family of stringed instruments**, 12-258  
**Violoncello**, musical instrument, 12-258, 226, 233  
     ancestor of, 12-222  
**Viper**, snake, 3-†489-90, \*482  
**Vireo**, bird, 4-†60-61  
     graph of song, 4-\*5  
**Virgil** (**Publius Virgilius Maro**), life and writings, 13-†47-48  
     birthday celebrated in 1930, 13-49  
     describes sibyl of Cumae's cave, 5-207  
     friendship for Horace, 13-50  
     in painting by Corot, 11-\*328  
     in the "Divine Comedy," 13-\*60, 61  
     pastoral poet, 9-70  
     portrait, 13-\*49  
     quotation from "Georgics," 8-320-B  
     reading Aeneid to emperor, 13-\*48  
**Virgin**, constellation, *see* Virgo  
**"Virgin, The,"** painting by Thayer, 11-\*372  
**"Virgin and Child,"** painting by Bellini, 12-\*213  
**Virgin Islands**, West Indies, 7-62; 8-467  
     government, 8-467  
     map, 7-601  
     products, 7-62; 8-467  
     U. S. possessions in, 8-467; 7-307  
**Virgin Mary**, *see* Mary, Virgin  
**Virgin of Guadalupe**, 7-81  
**Virgin of Or San Michele**, 11-124, 128  
**Virgin Queen** (Elizabeth, queen of England), 12-396  
**Virgin River**, U. S., 8-234-A, 396  
**"Virgin Soil,"** by Ivan Turgeneff, 13-93  
**"Virgin with the Rosary, The,"** painting by Murillo, 11-\*254  
**Virginal**, spinet, 12-258-F, \*221, 222  
**Virginia**, state, U. S., description and history, main article, 8-†405-17; general data, 8-418-418-B  
     agriculture, 8-406, 409, 412, 413-14  
     fruit growing, 8-\*414, 415  
**Virginia**, agriculture—*continued*  
     growing season, 8-418  
     peanut growing, 8-414; 9-†199  
     tobacco growing, 8-406, 408, 409, 414-9-\*130  
     animal life; fox squirrel, 4-368  
     area, 8-418  
     capital, 8-418-A  
     capital and capitol building, 8-\*405  
     charities and correction, 8-418  
     cities, towns, list, 8-416-17, 418-B  
     climate, 8-418, 414, 415  
     counties, list, 8-418-B  
     Dismal Swamp, 9-437; 8-410, 415  
     earliest buildings, 11-\*497, \*498, 499  
     education, 8-417  
         institutions of higher learning, list, 8-418  
     Ellen Glasgow depicts in novels, 13-352  
     erosion of soil, 8-417  
     first mail service, 10-87  
     flag, 8-418-A  
     history, 8-405-10  
         charter: House of Burgesses, 8-408; 7-123  
         Civil War, 8-412  
         constitution, Jefferson's influence upon, 12-504  
         expedition to Nova Scotia, 8-151  
         first settlement in Roanoke, 13-480  
         Indiana claimed, 8-112  
         Jamestown colony and early history, 7-†121-23  
         made a dominion, 7-123  
         Ohio land, 8-306  
         Patrick Henry's part in politics, 12-483  
         signs Declaration of Independence, 7-173  
         western land given up, 7-176  
     holidays, 8-418-A  
     Indians, 8-412  
     interesting facts, 8-418-A  
     location, 8-418  
     map, 8-552  
         on United States map, 7-595  
     Memorial Day originated by, 14-584  
     mineral springs, 8-415  
     monuments and points of interest, 8-418-A:  
         7-412, \*413, 414  
         Lee's statue at Richmond, 8-\*406  
         Natural Bridge, 1-\*53  
         underground cave, 1-\*87  
         Victory Monument, 8-\*408  
         *see also* parks *below*  
     motto, 8-418-A  
     name, 8-418-A  
     nickname, 8-418-A  
     parks, 8-418-A  
     people contrasted with West Virginians, 8-433  
     physical features, 8-418, 410, 411  
     plantations, 8-408, 410, 415  
     political facts, 8-418  
     products and industries, 8-406, 409, 413 fol.  
         cause for growth of manufactures, 8-415  
         *see also* agriculture *above*

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Virginia, state, U. S.—continued**

- religion, 8-412
- rivers, 8-410, 411, 418
- slavery, 8-409; 7-123
- state bird, 8-418-A
- state flower, 8-418-A
- state song, 8-418-A
- transportation, 8-408, 415
  - river, 8-418
- Virginia, University of**, Charlottesville, Va., 8-407, 417
  - and Thomas Jefferson, 12-506
  - library, 8-\*407
- Virginia, Valley of**, 8-411
  - factories, 8-417
  - products, 8-414
- Virginia and Kentucky Resolution** against Alien and Sedition Acts, 7-199
- Virginia City**, Montana, capital of early mining region, 8-217
- Virginia Company**, London, 7-123
- Virginia Convention of 1861**, 8-433
- Virginia creeper**, tendrils, 2-\*154, 155
- Virginia Military Institute**, 8-417
- "**Virginia of Sagadahoc**," ship, 8-153
- Virginia Polytechnic Institute**, 8-417
- Virginia rail**, bird, 4-102
- Virginia Resolutions** defy Stamp Act, 12-482
- Virginian deer**, 4-\*402, 406
- Virginian opossum**, 4-\*469, 470
- Virginianus and Virginia**, Roman characters, 5-\*199
- Virgo (Virgin)**, constellation, 1-178
  - star maps
    - July and August, 1-178-H
    - March and April, 1-178-D
    - May and June, 1-178-F
  - zodiac, 1-\*170
- Viridis tea**, 9-137
- Viridus***, defined, 2-184
- "**Virtue, Liberty, and Independence**," motto of Pennsylvania, 8-342
- "**Virtute et Armis**," motto of Mississippi, 8-206-A
- Virtuoso**, in music, 12-258-D
- "**Virtute Non Armis Fido**," motto of Lord Gray de Wilton, 8-206-A
- Virus**, injected into eggs, 2-\*13
- Viruses**, size, 10-489
- Visby**, Sweden, 6-†393, \*394, 395
  - palace, 11-\*468
  - tribute paid to Denmark, 6-\*411
- Viscera**, internal organs
  - blood supply, 2-379
  - muscles of, 2-326
- Vischer, Peter**, bronze work, 12-\*21, †22
- Visconti**, Milanese ruling family, 6-301
- Viscose process** for making rayon, main article, 9-†83-86
- Vise**, tool, how to use, 14-†27
- Vishnu**, deity of the Hindu trinity, 5-372
- Visigoths**
  - capture of Rome, 5-254

**Visigoths—continued**

- in Spain, 6-319
- story of, 5-253
- Vision**, *see* Eyes; Sight
- "**Vision of St. Theresa, The**," sculpture by Bernini, 11-\*187, 188
- "**Vision of Sir Launfal, The**," by James Russell Lowell, 13-313
- Visit and search** by English navy, 7-208
- Visitation**, group from Chartres cathedral, 11-\*96
- "**Visitation**," sculpture by Luca della Robbia, 11-\*131
- Visor of helmet**, 14-\*381
- Vistula River**, in Central Europe, 10-258, 262; 6-469
  - length, 10-253
  - map, 6-604
- Visual doubles**, astronomy, 1-174
- Visual purple** in rods of eye, 2-298
- Vital statistics**, United States, 7-379
  - county statistics, 7-389
- Vitamins**, 2-363-65
  - bones hardened by, 2-321; teeth, 2-315, 316
  - chart, 2-359
  - cheese contains, 9-347
  - citrus fruits contain, 9-175
  - diseases caused by lack of, 2-363-65
  - in flour, 9-102
  - in oleomargarine, 9-373
  - in soybeans, 9-214-A
- Vitellius, Aulus**, emperor of Rome, led to death by mob, 5-\*237
- Vithoba**, Hindu god, 5-383
- Vitreous humor** of eye, 2-\*296, 297
- Vitruvius Pollio**, Marcus, writer, 11-425
  - influence upon architecture, 11-491
  - treatise on theater buildings, 12-328
- "**Vittoria**," ship, 13-462
- Vivian, Andrew**, 10-177
- "**Vivian Grey**," by Benjamin Disraeli, 12-440
- Vizier**, Egyptian, duties, 5-52
- Vladimir the Great (the Saint)**, 6-425
- Vladivostok**, Russia, 10-262
  - map, 5-581
- Vocal cords**, vibration, 1-450
- Vocal sac** of frog, 3-422
- Vocational Education, Federal Board of**, 7-316
- Vocational guidance**, possible vocational fields and allied subjects
  - agriculture, 7-†450-63
  - machinery, 7-†452-53, \*455; 9-\*26, \*157; 10-†409-13
  - plant diseases, 2-†136-41
  - plants that give us food, *see* Contents Volume 9
  - truck gardening, 9-†150-54
  - see also* Agriculture, and also subhead agriculture under names of countries and under states of United States
  - archaeology, 5-†1-21; *see also* Archaeology; Architecture; Art; Crafts

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Vocational guidance—continued**

- architecture**, 12-†395-524  
*see also* Architecture; Building construction; Decoration and Ornament, architectural; Shelter
- army**, 7-†472-79
- art**, 11-†1-392  
*see also* Art; Arts and crafts and branches of art, as Painting; Sculpture
- athletics**, 14-†463-540; *see also* Sports and games
- building construction**, *see* Building construction
- business and clerical occupations**  
**banks and banking**, 7-†516-23  
**economics, story of**, 7-†495-578; *see also* Economics; Trade; Transportation
- ceramic industries**  
 brick and tile, 9-376, †378, 379  
**pottery**, 12-†40-61
- clothing and fashions**, 9-†2-95; *see also* Contents Volume 9
- crafts**, *see* Contents Volume 12, and also Crafts, and branches of crafts, as Basketry; Pottery
- engineering**  
**automobile**, 10-†277-91  
**aviation**, 10-†312-28  
**bridges**, 10-†209-14  
**cables**, 10-†101-6  
**building construction**, *see* Building construction  
**canals**, 10-†269-74  
**chemistry**, *see* Chemistry  
**communication**, *see* Communication  
**conservation**, 7-†465-70  
**dams**, 1-†366; 10-\*528, †529 fol.  
**electricity**, 1-†485-528; *see also* Electricity  
**engines**, *see* Engines  
**heating and ventilation**, 10-†379-85  
**invention**, *see* Contents Volume 10  
**irrigation**, 10-†528-33  
**lighthouses**, 10-†226-29  
**machinery**, *see* Machinery  
**minerals and metals**, *see* Table of Contents Volume 9  
**physics**, 1-†280-483; *see also* Physics  
**radio**, 10-†115-21  
**railroads**, 10-†185-200  
**refrigeration**, 10-†515-19; 1-†408-10  
**roads**, 10-†150-156  
**sewing machine**, 10-†442-44  
**steam**, *see* Steam  
**steamboats and steamships**, 10-†216-24, †293-304  
**submarine**, 10-†306-10  
**telegraph**, 10-†94-99  
**telephone**, 10-†108-13; 1-518-20  
**transportation**, 10-†128-328; *see also* Transportation  
**tunnels**, 10-†202-7

**Vocational guidance, engineering—continued**

- waterworks**, 10-†535-42  
*see also* Machinery
- finance**, *see* Economics
- food**, *see* Contents Volume 9  
 Animals That Give Us Food, *see* Contents Volume 9
- bread making**, 9-†238-43
- butter manufacture**, 9-†340-42
- canning**, 9-†226-31
- cheese**, 9-†344-48
- fishing**, 9-†361-70
- flour manufacture**, 9-†233-36
- meat industry**, 9-322-29  
 cattle raising, 9-†317-320
- oleomargarine**, 9-†372-73
- plants that give us food**, *see* Contents Volume 9
- poultry and eggs**, 9-†350-59  
*see also* Agriculture; Food
- government and politics**, 7-†345-402; *see also* Government, and also histories of various countries
- Constitution of United States**, text, 7-184-90
- invention**, *see* Contents Volume 9; *see also* Invention and discovery
- library work**, 10-†555-62
- literature**, *see* Literature
- lumbering**, 9-†245-58
- medicine and health**  
 anaesthetics, 10-550  
**anatomy and physiology**, 2-†278-397; *see also* Contents Volume 2  
 antiseptics, 10-550; 13-372  
 first aid, 2-†399-412  
 Galen and his studies, 13-†358-59  
 Hippocrates the father of, 13-†357-58  
 how to be healthy, 2-†414-21  
 medicinal plants, 9-†216-19  
 public health, 7-423, 443  
 radium, 9-†424-26  
 vaccination, 13-†366  
**X rays**, 10-†492-95
- metal working trades**, *see* Contents Volume 9
- mining**, *see* Contents Volume 9, and Minerals and Metals
- music**, 12-†201-322  
**musical instruments**, 12-258-58-E  
*see also* Music
- navy**, 7-†481-88
- photography**, 10-†446-52  
 moving pictures, 10-†502-12
- publishing**  
**newspaper**, 10-†73-82  
 paper manufacture, 9-†273-80  
**printing**, 10-†47-71
- science**, *see* Anatomy; Astronomy; Botany; Chemistry; Physics; Weather; Zoölogy
- social service**, 7-†433-44
- textiles**  
 cotton, 9-†26-34  
 cotton gin, 10-†403-4

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**Vocational guidance, textiles—continued**

linen, 9-†46-48

rayon, 9-†83-86

silk, 9-†36-44

spinning and weaving, 10-†338-46

wool, 9-†74-81

**Vocational Training Coordination Act, 7-33-I****Vogl, Johann Michael**, and songs of Schubert, 12-285**Voice box** (larynx), 2-336, \*337, 340**"Voice of the City, The,"** by O. Henry, 13-343**Voice signature**, earliest, 10-†498**Voices**, differences in, 1-450

reproduction by electric current, 10-110

trained and untrained, 12-244

vibrations operate electrical apparatus, 1-412, \*415

**"Voices of the Night,"** by H. W. Longfellow, 13-303**Volbehr, Otto**, 10-50**Volcanic dust**, 1-220, 235, 375, \*376, 377**Volcanic islands**, 5-521, 526, 528; 6-489, 491; 1-29**Volcanoes**, main article, 1-†75-76

Alaska, 7-416-17; 1-76

Atlantic islands formed by, 6-489, 491

Cape Verde Islands, 6-491

Cascade Range, 8-324

caves caused by, 1-86

Central America, 7-45

chimney, color plate, 1-frontispiece

cloud formed by eruption of, 1-\*235

cone, color plate, 1-frontispiece

Costa Rica, 7-48-B

Crater Lake National Park, 7-407

destruction of Pompeii and neighboring towns, 5-†257-58; 13-53

Dutch East Indies, 5-529-B

Ecuador, 5-518-F

Europe, 6-162-C

evidence of heat inside earth, 1-†383

Fujiyama, Japan, 5-\*364-A

gases and dust given off, 1-220, 375, \*376, 377

geysers are heirs to, 1-34

glass made by, 7-69

Hawaiian Islands, 1-\*10

Honduras, 7-48-A

islands formed by, 5-521, 526, 528; 6-489, 491

Hawaiian Islands, 8-461

Japan, 5-364 B

largest, 8-461

lava, 3-2

located in national monuments, 7-417

Mt. Lassen Volcanic National Park, 8-42-B

Mexico, 7-87-B; 1-76

Mount Osorno, Chile, 5-\*404

mountains formed by, 1-22

named for Vulcan, 1-75

New Zealand, 5-541-B, \*531

Pacific islands formed by, 5-521, 526, 528

Paracutin, newly born, 1-76

refuse on earth's surface, 1-41

**Volcanoes—continued**

Sicily, 6-476

U. S., recently active, 7-407

volcanic formations, 7-416-17

West Indies, 7-63, †64, 66

**Vole**, animal, 4-380, \*385; 3-222**Volendam**, Holland, costume, 6-\*351, \*352**Volga River**, Russia, 10-261

basin area, 10-257

length, 10-253

linked with Baltic Sea, 10-261

map, 6-602

outlet, 6-443-A

**Volksraad**, governing body in Dutch East Indies, 5-529-B**Vollard, Ambroise**

buys Cézanne's paintings, 11-384

Cézanne's portrait of, 11-383

**"Volpone,"** play by Ben Jonson, 12-330**Volstead Act**, 7-336**Volsunga Saga**, 14-310**Volt**, unit of electrical pressure, 1-509, 515**Volta, Alessandro**, 1-495, 509  
demonstrates experiment before Napoleon, 1-\*499

invents voltaic cell, 1-495

portrait, 1-\*495

**Voltage**, 1-509, †510, 515**Voltaic cell**, construction and current flow, 1-496**Voltaire, François Marie Arouet de**, life and influence, main article, 13-†117-19

attempt to reform state theater, 12-331

friendship with Catherine the Great, 12-417

Houdon's statue, 11-\*284, 286; 13-\*120

relations with Frederick the Great, 6-\*220, 222; 13-\*117, 118

**Voltmeter**, 1-\*509**Volume and weight**, 1-†467-74**Voluntary muscles**, 2-326, 327, \*330**"Volunteer State,"** nickname for Tenn., 8-366**Volutes**, architecture, 11-\*418, 423**Vomiting**, how brought about, 2-402**Vonnegut, Bernard**, scientist, 1-\*247**Vorticella**, single-celled animalcule, 2-\*280**Vortigern**, British king, 10-10**Voting**

Illinois' system, 8-106-A

importance of, 14-586

of stockholders, 7-580

see also Suffrage

**Voussoir**, in arch, 11-\*428**Vowels**, development of, in alphabets, 10-45**"Voyages and Discoveries of the Companions of Columbus, The,"** by Irving, 13-294**Voyages around the world**

first flight; U. S. army officers, 10-\*323

Magellan, 6-341; 13-463

Post and Gatty, 10-\*325

**Voyageurs**, Canadian pioneers, 7-137**Vulcan** (Hephaestus), god of fire and the forge, 14-408, \*409; 1-75

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Vulcan**—*continued*

- aids Orion, 14-<sup>\*</sup>418  
 Jupiter's head cleft by, 14-409  
**Vulcanized rubber**, 9-<sup>\*</sup>260, 268  
**Vulgate**, translated by St. Jerome, 7-331  
**Vulpine phalanger**, animal, 4-<sup>\*</sup>467

- Vultures**, birds of prey, 4-†159-64  
 head showing strange beak, 4-<sup>\*</sup>11  
*see also names of varieties, as Griffon vulture, etc.*  
**Vytautas**, Lithuanian grand duke, 6-<sup>\*</sup>461

**WAAC or WAC**, *see* Women's Army Auxiliary Corps

- Wabash River**, U. S., 8-106  
**Wabojeeg**, Indian chief, 7-108  
**WAC Corporal**, rocket, 10-<sup>\*</sup>365  
**Waccamaw River**, U. S., South Carolina, 8-356  
**Wadi Draa River**, Africa, 5-452  
**WAFS**, *see* Women's Auxiliary Ferrying Service  
**Wages** (salary), 7-533, 536  
 collective bargaining, 7-541  
 New England, 8-239  
 of management, 7-537  
 Russia, 6-442  
 worker's control over, 7-540, 559  
**"Wages of War, The,"** by H. P. Gray, 5-<sup>\*</sup>177  
**Wagner, Cosima Liszt** (Frau Richard Wagner), 12-†296, 298  
**Wagner, Minna Planer** (Frau Richard Wagner), 12-294  
**Wagner, Richard, life and works**, main article, 12-†293-96, 249-52  
 admiration of Richard Strauss for, 12-315, 316  
 and Liszt, 12-295, <sup>\*</sup>296, 297  
 mastersingers in opera of, 12-217  
 minnesingers in opera of, 12-216  
 portraits, 12-<sup>\*</sup>241, <sup>\*</sup>250, <sup>\*</sup>294, <sup>\*</sup>296  
 "Ring of the Nibelungs," operas, 14-310  
 use of brasses, 12-258-B  
**Wagner-Connery Labor Relations Act**, 7-341-B  
**Wagon**, express, how to make, 14-†45  
**Wagon-head vault**, 11-463  
**Wagons**, 10-†143, †144, <sup>\*</sup>145  
 covered, 10-†146, 148, <sup>\*</sup>153; 7-<sup>\*</sup>231, <sup>\*</sup>232  
 earliest horseless, 10-†175-78, 277, <sup>\*</sup>280  
**Wahhabis**, Mohammedan sect, 5-399  
**Wahpeton**, N. Dak., Indian school, 8-302-A  
**Waiblingen**, *see* Ghibellines  
**Waikato**, river, New Zealand, 10-253  
 map, 5-598  
**Waikatos**, tribe, New Zealand, 5-539  
**Waikiki Beach**, Hawaii, 8-456, <sup>\*</sup>457  
**Wailing Wall**, Jerusalem, 5-<sup>\*</sup>131  
**Wainwright, General Jonathan**, surrender, 5-568-A  
**Waitangi, Treaty of**, 5-<sup>\*</sup>534, 536  
**"Waiting for a Breeze,"** painting by Carlton T. Chapman, 11-<sup>\*</sup>371  
**"Waiting for Lefty,"** play by Odets, 13-355  
**Wake Island**, Pacific Ocean, 8-464  
 map, 5-572

- "Wake-Robin,"** by John Burroughs, 13-426  
**Wake robin** (trillium), flower, 2-<sup>\*</sup>147  
 pollination by midges, 2-†106  
**Wakefield, Edward Gibbon**, organizes New Zealand Company, 5-534  
**Wakefield, Va.**, Washington's birthplace, 7-414  
**Wakefield, Battle of**, 6-39  
**Wald, Lillian D.**, welfare worker, 7-443  
**"Walden, or Life in the Woods,"** by Henry David Thoreau, 13-311  
**Waldo, Samuel L.**, portrait by, 11-<sup>\*</sup>370  
**Waldstein, Ferdinand**, count, and Beethoven, 12-278, 279  
**Wales, Church of**, 6-141  
**Wales, Prince of**, origin of title, 6-25, 139  
**Wales**, principality, Great Britain, **description and history**, main article, 6-†136-41, general data, 6-108-B  
 area, 6-108-B  
 bards, duties and ceremonies of, 6-†136, 138, 139, <sup>\*</sup>140, 141  
 ceremonial of Eisteddfod, 6-†136, 139, <sup>\*</sup>140, 141  
 climate, 6-108-B  
 education, 6-141  
 history, 6-†136-41  
 Celts and other races, 6-136  
 Irish kings, 6-144  
 subdued by Edward I, 6-25, 139  
 subdued by Henry IV, 6-35  
 union with England, 6-140  
 industries and trade, 6-139, 140  
 literature, 6-141  
 location, 6-108-B  
 maps, 6-572  
 on map of Europe, 6-570  
 mining, 6-108-B  
 musical instrument, 12-<sup>\*</sup>226  
 peasant costume, 6-<sup>\*</sup>136, <sup>\*</sup>137, <sup>\*</sup>139, <sup>\*</sup>140  
 people, 6-108-B  
 physical features, 6-108-B  
 religion, 6-140, 141  
**"Walk-in-the-Water,"** steamboat, 8-182  
**Walker, John**, 10-332  
**Walker, Thomas, Dr.**, 8-135, 368  
**Walker**, island, No. Pacific Ocean, 8-466  
**Walker Lake**, Nevada, 8-231  
**Walker River**, U. S., 8-234-A  
**Walking**, correct method, 2-415  
**Walking sticks**, insects, 3-351, †352-54  
**"Walküre, Die,"** opera by Wagner, 12-295, 296

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Wall board**, used in building, 9-<sup>\*</sup>294  
**Wall paintings**, Egyptian, 11-<sup>\*</sup>6, 10; 12-26  
**Wall Street**, New York, 7-<sup>\*</sup>510  
 becomes financial center of the United States, 7-290  
**Walla Walla Indians**, in Oregon, 8-327  
**Wallaby**, kangaroo, 4-<sup>\*</sup>461, †462  
**Wallace, Alfred Russel**  
 theory of evolution, 13-436; 2-319  
**Wallace, Frederick William**, Canadian author, 7-29-1  
**Wallace, Henry A.**, 12-456-G; 7-343-B  
**Wallace, Sir William**, main article, 12-†379-82  
 services to Scotland; death, 6-113  
 trial, 12-<sup>\*</sup>382, 383  
 war with England, 6-25  
**Wallaroo**, kangaroo, 4-462  
**Walled town**, medieval, 5-264, <sup>\*</sup>309  
**Wallenstein (Waldstein), A. W. E. von**, duke of Friedland  
 and Gustavus Adolphus, 12-402  
 in Thirty Years' War, 6-214  
**"Wallenstein,"** by Schiller, 13-279  
 Coleridge's translation, 13-218  
**Wallingford**, England, charter, 5-311  
**Wallkill**, river in New York, 8-283  
**Walloon**, district, Belgium, 11-197  
**Walloon**, French dialect, 6-355-B  
**Walloonian**, district of Belgium, 6-355-B  
**Walloonians**, people of Belgium, 6-355-B, 351  
**Walls**  
 Athens, 5-166  
 brick laying, 9-378  
 China, <sup>\*</sup>see Great Wall of China  
 Danevirke, 6-409  
 Hadrian's Wall, 11-429  
 Iberian, 6-318  
 primitive dwellings, 11-395  
 Roman, 5-<sup>\*</sup>203, 205  
 Visby, Sweden, 6-<sup>\*</sup>393  
**Walnut**, tree, 2-<sup>\*</sup>270  
 value of fruits and wood, 9-258; 2-159  
<sup>see also</sup> Walnuts  
**Walnut Canyon National Monument**, Ariz., 8-24-A  
**Walnuts**, 9-201-3  
 black walnut, 9-203  
 California's industry, 8-<sup>\*</sup>35  
 English walnut, 9-201, 202, <sup>\*</sup>204  
**Walpole, Horace**  
 and Chatterton, 13-205  
 association with Thomas Gray, 13-203  
**Walpole, Robert**  
 administration, 6-78  
 and Fielding, 13-187  
**Walrus**, marine animal, 4-332, †333, <sup>\*</sup>335  
 clam diet, 3-152  
**Walrus hunter**, 6-<sup>\*</sup>388  
**Walsegg, Count**, gives commission to Mozart, 12-270  
**Walsingham, Sir Francis**, 6-54  
**Walter, Hubert**, rule of England left to, 12-373  
**Walter, John**, prints "Times" by steam, 10-77  
**Walter the Penniless**, crusader, 5-282  
**Walton, Izaak**, life and work, main article, 13-†165-66  
 portrait, 13-<sup>\*</sup>166  
**Wamba**, Gothic king in Spain, reign, 6-†338  
**Wanderer** (albatross), bird, 4-†215-17  
**Wanderoo**, monkey, 4-258  
**Wandiwash, Battle of**, 5-382  
**Wang Anshih**, Chinese statesman, 5-327  
**Wang Ching-wei**, puppet ruler in China, 5-336  
**"Wanigan,"** in logging camp, 9-248  
**Wapiti**, deer, 4-405, <sup>\*</sup>407, 412  
**"War,"** meaning of prefix in "Warwick," 8-66-A  
**"War and Peace,"** by Count Leo Tolstoy, 13-92  
**War and warfare**  
 aerial photography, 10-452  
 Assyrians trained in, 5-91  
 Belgium a battleground, 6-346  
 canned foods used, 9-228  
 caused by trade barriers, 7-576  
 class wars begun by proletariat, 7-549  
 company formation of Sumerians, 5-78  
 dangers to civilians, 10-368  
 explosives; invention and use, 10-416  
 food prices affected by, 7-577  
 horses used in, 4-510  
 Kellogg-Briand pact against war, 6-442  
 Machine Age methods, 6-104  
 trade affected by, 7-577  
 trade barriers cause, 7-576  
 United States  
 participation in, 7-475  
 preparation and equipment for, <sup>see under</sup>  
 United States Army; United States  
 Marine Corps; United States Navy  
<sup>see also</sup> Disarmament; Peace; Weapons, and  
 names of wars, as World War  
**War colleges**, 7-479-C  
**War craft**, <sup>see</sup> Battleships; Galleys; Sub-  
 marines; Warships  
**War crimes trials**, 6-557, <sup>\*</sup>241-A  
**War debts**  
 international bank, 7-527  
 United States, 7-339, 340  
**War Department, United States**, 7-475-76, 479-E  
 flag of Secretary, color plate, 14-facing <sup>\*</sup>571  
<sup>see also</sup> United States Army  
**War Hawks**, political party, 7-222  
**War Industries Board**, 7-324, 331  
**War Labor Board**, 7-332  
**War Museum**, Brussels, 6-346  
**War of 1812**, 7-<sup>\*</sup>202, †209-11  
 Battle of Lake Erie, 12-†499-500  
 Canada's part in, 7-15  
 causes, 6-90, 91; 12-506  
 Houston's role in, 12-515  
 Marines' part in, 7-<sup>\*</sup>492, 493  
 naval officer's uniform, 7-<sup>\*</sup>483  
 Treaty of Ghent, 7-211  
**War of Jenkin's Ear**, 13-190

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- War of Liberation**, 6-\*225, 226  
**War of Secession**, *see* Civil War  
**War of the Austrian Succession**, 6-264  
     France's part in, 6-186  
     French and British in India, 5-381  
     Germany's ambitions, 6-220  
**"War of the Classes, The,"** by Jack London, 13-341  
**War of the Pacific**, 5-510  
**War of the Reform**, Mexico, 7-84  
**War of the Roses**, Japan, 5-348  
**War of the Spanish Succession**, 6-219, 331  
     England's part in, 6-75  
     France, 6-184  
**"War Song of the Army of the Rhine, The,"** by Rouget de Lisle, 12-242  
**Warbeck, Perkin**, claim to throne, 6-42  
**Warblers**, 4-†57-60, †47-48  
     graph of song, 4-\*5  
     nest building, 4-†58  
     reed warbler, 4-175  
     willow warblers, 4-\*174  
     yellow warbler, 4-\*4, †58-59, 89  
         color plate, 4-\*25  
**Ward, Artemus** (Charles Farrar Browne) and Mark Twain, 13-329  
     quoted, 7-255  
**Ward-McIlhenny Game Refuge**, in Louisiana, 4-517  
**Ware**, English architect, 11-502  
**Warens, Madame de**, and Rousseau, 13-18  
**Warm Springs**, Georgia, *see* Georgia Warm Springs Foundation  
**Warner, Olin L.**, statue by, 11-\*375  
**Warp**  
     basket weaving, 12-135  
     tapestry weaving, 12-138  
     thread, 10-342  
**Wars of the Chrysanthemums**, 5-350  
**Wars of the Roses in England**, results, 6-42  
**Warsaw**, Poland, 6-454-B  
     map, 6-605, D3  
     National Theatre, 6-\*454-A  
     rainfall and temperature, 6-\*454-A  
     river transportation, 10-258  
**Warsaw, Duchy of**, set up by Napoleon, 6-454  
**Warships**  
     after invention of gunpowder, 10-358 fol.  
     armored, 10-\*348, †360, \*365, 367  
     cruisers, 7-484; 10-\*348, 367  
     destroyers, 7-484; 10-\*348, 367  
     English man-of-war, early type, 10-\*158, \*165  
     first made of iron, 13-†439  
     galleys  
         Greek and Roman, 5-\*211, 212, 213; 10-\*162 fol., †351; 12-4  
         viking, 10-\*163  
     how named, 7-488-D  
     improvements in construction, 7-482, 483  
     iron prows used by Romans, 12-4  
     maneuvers, 7-488-C  
     privateers, 10-†158  
**Warships—continued**  
     use of wireless, 10-116  
     *see also* Battleships; Submarines; United States Navy  
**Wart hog**, 4-433, \*436  
**Wartburg**, fortress, Eisenach, Germany, Luther's hiding at, 13-544  
**Warton, Thomas**, 13-\*194  
**Warwick**, estate in England, many versions of name, 8-66-A  
**Warwick, Richard Neville**, earl of, 6-37, 39  
**Warwick Castle**, England, 10-356  
     Caesar's Tower, 11-477  
**Warwickshire foxhound**, 4-\*495  
**Wasatch National Forest**, Utah, forest fire, 10-\*336  
**Wasatch Range**, Utah, 8-396, \*395  
     formation, 8-392  
**Washhouses**, by rivers and springs, 6-\*485  
**"Washington,"** name, origin, 8-428 A  
**Washington, Booker T.**, life, main article, 12-†569-70  
     portrait, 12-\*569  
**Washington, George**, president of the U. S., biography, main article, 12-†473-78, 456-E  
     administration, 12-478; 7-†192.97  
     Alexander Hamilton aide to, 12-508  
     and Lafayette, 12-\*450, \*452, 453  
     and Major André, 12-485  
     arrival in New York for inauguration, 7-\*181, 182  
     birthday a national holiday, 14-578  
     birthplace a monument, 7-414  
     carving on Mount Rushmore, 8-\*361  
     coach, 10-146  
     commander-in-chief of army, 7-472  
         resignation, 7-\*180  
     commands colonial forces, 7-164, \*167, \*169, 170  
     confidence in Benedict Arnold, 12-487  
     Constitutional Convention, 12-\*496  
     departure from New York, 12-\*477  
     desk used by, 12-\*197  
     dream of a national highway, 10-153  
     Farewell Address, 7-196  
     flags used by, 14-†574, 575  
     Fort Necessity, 8-341  
     French and Indian War, 7-141, 143  
     interest in western lands, 12-474, 475  
     John Adams vice president for, 12-480  
     Molly Pitcher honored by, 12-493  
     Morristown, N. J., home, 7-412  
     Mount Vernon, 11-\*513; 12-\*473, 474  
     painting; watching first coin struck, 7-\*516  
     portraits, 7-\*175  
         Peale, 7-\*178  
         Stuart, 11-\*355; 12-\*474  
     refusal to be made dictator or king, 7-197  
     Revolutionary War, 12-†475-78  
         Valley Forge, 12-\*475  
         Yorktown, 12-\*477, 478

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Washington, George—continued**

- sculptured portraits
  - carving on Mt. Rushmore, S. D., 11-361
  - statue by Houdon, 11-284
  - statue, Subtreasury, New York, 7-198
- smallpox in Barbados, 7-66
- statehouse where military resignation took place, 8-158
- surveying, 12-474; 8-432
- tomb, 12-478
- Washington and Lee University endowed by, 8-417

**Washington, Lawrence, 11-513; 12-473**

- Washington, Martha Dandridge Custis** (Mrs. George Washington), as First Lady, 12-558-59, \*560
  - gown worn by, 9-15
  - marriage, 12-475
  - portrait, 12-559

**Washington, Mary Ball, mother of Washington, 12-476****Washington, Ark., confederate capital, 8-28****Washington, state, U. S., description and history, main article, 8-420-27; general data, 8-428-428-B**

- agriculture 8-424 fol., 428
  - pea vining on truck farm, 9-153
- area, 8-428
- charities and correction, list, 8-428
- cities, towns, list, 8-427, 428-B
- climate, 8-428
- counties, list, 8-428-A
  - institutions of higher learning, list, 8-428
- flag, 8-428-A
- Grand Coulee Dam, 7-460
- holidays, 8-428-A
- interesting facts, 8-428-A
- location, 8-428
- map, 8-554

- on United States map, 7-594

- motto, 8-428-A

**Mount Olympus National Monument, 7-420**

- name, 8-428-A

- nicknames, 8-428-A

- parks, 8-428-A

- Mount Rainier National Park, 7-408

- physical features, 8-428

- political facts, 8-428

- products and industries, 8-424 fol.

- fruit growing, 9-162, 163-64

- lumbering, 9-257

- salmon fisheries, Columbia River, 9-366

- wheat raising, 9-101

- reservations, game and bird, 8-428-A

- rivers, 8-428

- state bird, 8-428-A

- state flower, 8-428-A

- state song, 8-428-A

**Washington, D. C.**

- burned by British, 7-211

- city plan, 7-446

- early architecture, 11-511

**Washington, D. C.—continued**

- government moved to, 8-336
- map, 8-504
- public buildings
  - Archives Building, 11-523
  - painting from Exhibition Hall, 12-496
  - Capitol, 11-511, \*512
  - Department of Commerce Building, 7-375
  - Henry C. Folger Library 10-561
  - Library of Congress, 10-555, 561
  - Lincoln Memorial, 11-521; 12-524
  - National Museum, 7-370
  - Pentagon Building, 7-373
  - Senate Building, 7-368
    - interior view, 7-290
  - Treasury, 7-287, \*372, \*495
  - United States Treasury Building, 7-287, \*372
  - White House, 11-511, \*513; 12-558 fol.
- Washington, Mount, height, 1-28**
- Washington and Lee University, Lexington, Va., 8-417**
- Washington and Tusculum College, 8-369**
- "Washington Beloved," song, 8-428-A**
- Washington County of North Carolina, 8-368**
- "Washington Crossing the Delaware," picture, 7-169**
- Washington District, district now Tennessee, 8-374**
- Washington Island, Green Bay, Icelandic fishermen, 8-442**
- Washington Monument, Wash., D. C., 7-288**
- Washington of South America (Simon Bolivar), 12-438**
- "Washington Square," by Henry James, 13-336**
- Washington University, St. Louis, Mo., 8-212**
- Washita, or Ouachita River, Arkansas and Louisiana, 8-30-A, 146**
- Washita River, Texas and Oklahoma, 8-320-A**
- Washoe Mountains, Nevada, 8-234-A**
- Wasp outboard airplane engine, 10-322**
- Wasps, 3-304-07, \*272, \*296, \*298**
  - anatomy, 3-305
  - capture of spider, 3-412
  - enemy of bollworm, 9-34
  - fig wasp pollinates caprifig, 2-112
  - insects paralyzed by, 3-298, 307
  - nests, 3-304 fol.; 9-273
  - queen, 3-306
  - social life, 3-306
- Waste basket, how to make, 14-53**
- Waste disposal, see Sewage**
- "Waste Land, The," poem by T. S. Eliot, 13-353**
- Watauga Association, 8-368**
- "Watch" at sea, 10-300, 469**
- Watches**
  - history of, 10-468
  - jewels in, 9-433
  - manufacturing centers, Illinois, 8-104
  - spiral spring invented, 13-377
  - Switzerland famous for watchmaking, 6-254
  - to-and-fro balance wheel, 1-292

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

"Watchful waiting," Woodrow Wilson's policy, 12-550; 7-316

**Water**

absent on moon, 1-139  
amount and weight of rainfall, 1-89  
amount necessary to health, 2-420  
amount on the earth, 1-†66, \*363, 364  
amount used daily by Americans, 10-535  
animal life in, *see also* *Animals*, water creatures;  
Fresh water, animal life in; Ocean, animal life in  
behavior of solids in, 1-†467-74  
boiling, 1-402, 404, 482  
causes caves and sink holes, 1-85  
cautions about, for campers, 14-554, \*556  
change into steam, 1-404  
composition, 1-11, 357, †363-65  
chemical; discovery, 13-378, 381  
conduction, electricity, 1-514  
heat, 1-\*397  
sound, 1-†445, 446  
convection currents set up in, 1-398  
dew formation, 1-†240, \*241  
earliest forms of life dwelt in, 3-6  
effect upon rocks, 1-†95 fol.  
electrolysis of, 1-†363-64  
erosion caused by, 7-469  
expansion and contraction, 1-481-83  
film on ice, 14-519  
fire extinguishing with, 1-385  
first on earth, 1-11, 47  
freezing, 1-482  
"heavy water" (deuterium), 1-558-D  
helps form stalactites and stalagmites, 1-86  
holds the body up, 14-535  
hot springs and geysers, 1-†32-36  
human body's content, 2-420  
blood contains, 2-345  
impurities: sicknesses caused by, 10-540  
life dependent upon, 1-373  
*see also above* human body's content, and  
*below* plant life  
natural formations caused by, 7-417, 419  
never destroyed, 1-89  
plant life contains, 2-46, 193, 197  
flow and evaporation in trees, 2-237  
fruits and vegetables, 2-259  
storage by desert plants, 2-204  
transpiration, 2-51  
*see also* *Water plants*  
purification, 10-\*540, 542  
by algae, 2-69  
by chemicals, 10-542, 545, 549  
refraction of light, 1-†430, \*431  
sea water  
treatment for aquariums, 3-217  
treatment for drinking, 5-418  
seeks own level, 1-369  
soil eaten away by, 7-466  
sunlight transformed by passage through, 1-87

**Water—continued**

surface tension, 1-†360; 3-258  
synthesized by Cavendish, 13-378  
taste affected by algae, 2-68  
tunneling under, 10-\*202, \*205, 206-7  
underground streams and lakes, 1-†89-92  
vapor, *see* *Water vapor*  
weight and pressure, 1-†365-70, 472  
world made of; ancient theory, 13-2  
*see also* *Rain and rainfall*; *Water supply*  
"Water-Babies, The," by Kingsley, 13-246  
Water beetle, 3-\*333, \*400  
Water birds, *see* *Birds*, water birds  
Water biscuit, 9-240  
Water boa, snake, 3-496, \*498  
Water boatman, insect, 3-†403  
Water bottles, pig skin, 6-\*315-A  
Water buck, 4-418, \*419, \*421  
Water buffalo, 4-\*393, 394, \*395; 5-\*565  
milk, 9-332  
Water bug, 3-†402-4, \*396  
Water Carrier, constellation, *see* *Aquarius*  
Water carriers, 5-\*66, \*409; 10-†537  
Water chicken (Florida gallinule), 4-102, 109  
nest, 4-110  
Water clocks, 10-†461, \*462  
glass, 12-27  
Water conveyances and travel  
canals, 10-†269-74  
compass, 10-†454-57  
dams, *see* *Dams*  
docks and harbors, 10-†244-50; *see also* *Docks and harbors*  
early boats, 10-†136-40  
inland waterways, 10-†252-68  
merchant marine, 10-†231-42  
river transportation, *see* *Rivers*, transportation  
sailing ships, 10-†158-73  
steamboats and steamships, 10-†216-24  
transatlantic and other steamship lines, 10-222-24  
tubes, 10-\*202, \*205, 206-7  
wartime, *see* *Warships*  
*see also names of water conveyances, as* *Canoes*; *Galleys*  
Water cooling system, of automobile, 10-†286  
Water courses, formation, main article, 1-†46-49  
effect upon surface of land, 1-\*18, 21-22  
salt carried by, 1-44  
*see also* *Rivers*  
"Water divining," with aid of stick, 1-†90  
Water dragon, insect, 3-\*386, 390, \*397  
Water fairy, shrimp, 3-257  
Water gap, in physiography, 8-431  
West Virginia, 8-436-A  
Water-gas plant, 10-\*391  
Water-heating system, automatic, 1-476, †477  
Water hen, 3-223  
Water hog (capybara), 4-378, †379  
Water jars, 12-\*15, 50, 131  
Water lily, 2-\*199, †200  
Water lizard, 3-451

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Water mills**, 9-<sup>\*</sup>233, 234  
**Water moccasin**, snake, 3-492, <sup>\*</sup>501  
**Water monitor**, lizard, 3-460, <sup>\*</sup>461  
**"Water Nix,"** fairy tale, text, 14-<sup>†</sup>253-54  
**Water nymphs** in Greek mythology, 14-435  
**Water opossum**, 4-469  
**Water pitcher**, silver, 12-<sup>\*</sup>85  
**Water plants**  
   algae, 2-<sup>†</sup>66-69  
   flowering plants, 2-<sup>†</sup>199-201  
   monocotyledons, 2-149  
   seed dispersal, 2-212  
   stems, 2-32  
**Water pollination**, 2-148  
**Water power**, 1-369-70  
   compared with steam, 10-395  
   generation of electricity, 1-508  
   sources and uses, 1-369-70, 508  
   Alabama, 8-3  
   Wilson Dam, 7-<sup>\*</sup>499  
   water wheels, 1-370, <sup>\*</sup>505  
**Water pressure**, 1-<sup>†</sup>365-69  
   effect on divers, 10-522, 524  
   exerted on floating object, 1-469  
   ocean, 1-67  
   Pascal's principle; hydraulic press, 1-<sup>†</sup>368  
   pipes, 1-509  
**Water-proof substances** of plants, 2-26, 32, 116  
**Water scavenger**, insect, 3-400, <sup>†</sup>401  
**Water scorpion**, insect, 3-<sup>\*</sup>398, 402  
**Water shrew**, animal, 4-281, <sup>\*</sup>282; 3-<sup>\*</sup>223  
**Water skiing**, sport, 8-<sup>\*</sup>75  
**Water spider**, 3-393, <sup>†</sup>394  
**Water strider**, insect, 3-403, <sup>†</sup>404  
**Water supply**  
   city water systems, 10-<sup>†</sup>535-42; 7-<sup>\*</sup>396, 398  
   methods of securing, 10-538  
   control by dams and reservoirs, 7-465  
   costs, 10-531, 538  
   hot water supplied by hot springs, 6-483  
   irrigation systems, 10-<sup>†</sup>528-33; *see also* Irrigation  
   melted snow important to, 1-254  
   primitive people's, 10-<sup>\*</sup>538  
   purification, 10-<sup>\*</sup>540  
     chemical knowledge improves, 10-542, 545, 549  
   Roman aqueducts, 10-<sup>\*</sup>535, 537, 538; 11-<sup>\*</sup>63, <sup>\*</sup>427, 429  
   village washhouses, 6-<sup>\*</sup>485  
   waste of, 1-352  
**Water thermometer**, Diesel engine, 10-<sup>\*</sup>276  
**Water thermometers**, 1-<sup>\*</sup>389, 390  
**Water thrush**, 4-<sup>†</sup>47  
**Water tiger**, insect, 3-399  
**Water torch**, cat-tail spike, 2-145  
**Water tubercle**, of starfish, 3-130  
**Water turbine**, operation, 1-370  
   ancestor, 1-<sup>\*</sup>505  
**Water turkey**, 4-149; 10-<sup>\*</sup>2  
   color plate, 4-<sup>\*</sup>152  
**Water vapor**  
   an essential gas, 1-376  
   condensation, 1-235, <sup>†</sup>239-41  
   in atmosphere, 1-219, 239  
**Water veins** in earth, 1-90  
**Water vole**, animal, 4-380, <sup>\*</sup>385; 3-222  
**Water wagtail**, bird, 4-175  
**Water waves** of ear, 2-305  
**Water wheels**, 1-370, <sup>\*</sup>505; 10-<sup>\*</sup>398  
**Water witch** (grebe), bird, 4-110  
**Waterbound macadam roads**, 10-156  
**Waterbury**, Conn., 8-60  
**Wateree or Catawba River**, U. S., 8-356  
   North Carolina, 8-296  
**Waterfalls**  
   highest 5-461  
   rock eaten by, 1-53  
   Shoshone Falls, Idaho, 8-87  
   Victoria, 5-<sup>\*</sup>486  
   *see also names of waterfalls, as*, Niagara Falls; Yosemite Falls, etc.  
**Watering pot shells**, 3-160  
**Waterloo, Battle of**, 12-<sup>†</sup>435  
   Blücher, 12-435; 6-226  
   Napoleon's downfall, 12-<sup>\*</sup>431, 432  
   portraits of heroes, 6-<sup>\*</sup>89  
   Wellington, 12-433, <sup>†</sup>435  
**Watermark** in paper, 9-277, 280  
**Watermelon**, 2-<sup>†</sup>120, <sup>†</sup>251, 259  
**Waterproof glue**, casein used in, 10-547  
**Waterproofing**, 9-261, 268, 269  
**Waterspout**, 1-<sup>†</sup>230  
**Waterton-Glacier International Peace Park**, 8-220-A  
**Waterton Lakes National Park**, Canada, 7-29-V  
**Waterton River**, Montana, U. S., and Alberta, Canada, 8-220  
**Waterville**, Maine, factories, 8-154  
**Waterville Notch**, added to national forest, 8-242-A  
**Waterways**, *see* Canals; Roadways, water; Rivers  
**Waterworks**, *see* Water supply  
**Watling Island**, *see* San Salvador  
**Watling Street**, old Roman road, England, 10-151, 152  
**Watson, Thomas**, aids Bell in invention of the telephone, 10-109, 111, 112, 113  
**Watt, James**, life and inventions, main article, 10-<sup>†</sup>399-401  
   and Industrial Revolution, 6-84  
   patents steam wagon, 10-176  
   portrait, 10-<sup>\*</sup>399  
   watching tea kettle, 10-<sup>\*</sup>395  
**Watt**, unit of electric power, 1-509, 523  
   origin of term, 10-401  
**Watteau, Antoine**, French artist, life and art, 11-<sup>†</sup>280-83  
   paintings  
     "Dance, The," 11-<sup>\*</sup>279  
     "Embarkation for Cythera," 11-<sup>\*</sup>281, 283  
     "Gilles," 11-<sup>\*</sup>280, 281  
**Wattle-work houses**, 11-495, <sup>†</sup>496; 12-<sup>†</sup>129, 130

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Wattles**, of chicken, 9-352
- Watts, George Frederick**, painting by, 14-\*423
- Watts-Dunton, Theodore**, 13-259
- Waugh, C. V., Dr.**, Florida's state song, 8-76-A
- Waugh, Sidney**, glassware, 12-\*38
- Waukesha, Wis.**, mineral waters, 8-444
- Wave theory of light**, 1-†416, 417
- "Waverley Novels,"** by Scott, 13-222
- WAVES**, *see* Women Appointed for Volunteer Emergency Service
- Waves**, electric, *see* Hertzian waves; Radio waves
- Waves**, ocean
- action on rocks, 3-4
  - calmed by oil, 1-360
  - caused by earthquakes, 1-80
  - Galveston disaster caused by hurricane and, 1-72
  - why foam is white, 1-439
- Waves**, heat, *see* Heat waves
- Waves of contraction** along digestive tract, 2-354
- Wawona Grove**, Yosemite National Park, California, giant sequoia, 2-\*253
- Wax**
- carving in, 12-107
  - electrotyping moulds of, 10-†57
  - for candles, 10-389
  - made by bees, 3-313, 314, 315
  - on leaf surface, 2-26
  - on plant stems, 2-32
- Wax tablets**, Roman, 10-\*34, 44
- Waxbill**, red-winged, bird, 4-182
- Waxwing**, bird, 4-†28-29
- nest building, 4-28
- "Way down upon the Swanee River,"** by Stephen Foster, 12-256
- "Way of the World, The,"** comedy by William Congreve, 12-331
- Wayland, John W., Dr.**, song by, 8-418-A
- Wayne, Anthony**, Stony Point taken by, main article, 12-†491-92
- Battle of Fallen Timbers, 8-306
- Waynesboro, Va.**, factories, 8-417
- We have a secret**, game, 14-154
- Wealth**
- and trade, 7-571
  - cattle as measure of, 9-333
  - division of, 7-†532-556
  - distribution, 7-548
  - socialists' theory of distribution, 7-549, 550, 551
- "Wealth of Nations, The,"** by Adam Smith, 13-19, 20
- Wealthew, Queen**, in Beowulf legend, 14-\*320
- Weapons**, main article, 10-†348-68-F
- after invention of gunpowder, 10-358-68, †348
  - Assyrian war machines, 5-91
  - bronze, 12-†13, 18; 10-350
  - decoration of, 10-351, \*355, \*359; 12-6, †13, 20
  - Egyptian, 11-†8
  - Eskimo, 7-†39
  - firearms, 10-†358-68-F
- Weapons—continued**
- for storming fortifications, 10-356, \*357, \*358, found in Britain, 6-\*9
  - Greek and Roman, 10-†351-52, \*357, \*358
  - iron, 12-†3, 4, 6; 5-91, 115
  - machines for throwing fire, 10-358
  - medieval, 10-†352-56, 358, \*359
  - primitive, 10-†349-50
  - Scandinavian, early, 6-372, 375
  - stone, of Red Paint People, 8-148
  - stone, still used today, 11-7
  - Stone Age, 5-24 fol.; 11-†2-3
  - swords of knights, 14-512
  - World War I, weapons and fighting methods, 10-†360-68-F; 7-\*319 fol.
  - see also* Arms and armor; and names of weapons, as Daggers; Swords
- Weasel**, animal, 4-†354-56
- appearance in prehistoric times, 3-52
- Weasel family**, main article, 4-†354-62
- Weasel lemur**, monkey, 4-268
- Weasels**, nickname for people of South Carolina, 8-356-A
- Weather**, main article, 1-†193-278 (*see also* entries under main subjects listed below)
- air currents, 1-†222-25
  - air-mass-and-front theory, 1-278-78-B
  - atmosphere, physical and chemical properties, 1-†216-20
  - atmospheric pressure, 1-†258-61
  - aurora borealis, 1-†526
  - clouds, 1-†234, 37
  - cyclones, 1-228, 277, 278-78-A
  - dew, 1-†240, \*241
  - fog, 1-\*237, †241-42, 407
  - forecasting
    - folklore and superstitions, 1-†263-68
    - work of the U. S. Weather Bureau, 1-†274-78
  - frost, 1-237, 240, \*251; 10-\*487
  - hot and cold, 1-†206-11
  - humidity, 1-240, 376, 393
  - influence on civilization, 1-†193-97
  - isobars on weather map, 1-277
  - isotherms on weather map, 1-277
  - lightning, 1-†245 fol.
  - "Low," center of bad weather 1-\*278-B
  - mirages, 1-272, †424, 426; 5-453
  - moisture in atmosphere, 1-†239-42
  - precipitation, 1-†244-49
    - hail, 1-†249
    - rain, 1-†244-49, †254-56
    - snow, 1-†251-54
    - thunderstorms, 1-†246, †247-49
  - prehistoric conditions, 1-196
  - rainbow, color plate, 1-435, †271
  - seasons, 1-†206-11
  - sky, 1-†270-71
  - sunlight, 1-†199-204
  - temperature measurement, 1-†207-8
  - tornadoes, 1-\*229, 230
  - winds, 1-†227-32

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



- Weather Bureau, U. S.**, main article, 1-†274-78-78-B; 7-380  
 air-mass-and-front theory, 1-278-78-B  
 balloons used by, 1-†259  
 kites used by, 14-500  
 organization: equipment, 1-274, †276  
 reports and maps, 1-276; 10-326  
 services, 1-278  
 thermometers used by, 1-391, 392  
**"Weather Folklore,"** by Garriot, 1-268  
**Weather maps**, 1-276, 277  
**Weather reports**, 1-276  
**Weather stations**, 1-276  
**Weather vane**, how to make, 14-†48  
 drawing and mounting for, 14-†69  
**Weaver, James B.**, farmers' candidate for president, 7-291  
**Weaver bird**, 4-†182  
 nest building and breeding, 4-†182  
**Weavers**, coöperative society formed by, 7-553  
**Weaving**, 10-†342-46  
 basketry, 12-129, 135  
 by prehistoric man, 5-†35  
 carpet making, 10-†343-45  
 linen, 9-46, 48  
 Mayan, 7-90  
 most famous piece in world, 12-154  
 rugs  
   hand made, 12-†151, †152; 10-†345  
   machine made, 12-†160, 161  
 tapestry, 12-138  
*see also* Spinning and weaving  
**Web** woven by spider, 3-†408-9, 411, 413; 10-†480  
**Web-feet**, people of Oregon, 8-332  
**Web-foot State** (Oregon), 8-332  
**Weber, Aloysia**, and Mozart, 12-268, †269  
**Weber, Carl Maria Friedrich Ernst von**, life and works, 12-†281-82  
 operas, 12-250  
 portrait, 12-†241  
 use of clarinet, 12-258-B  
 use of horn, 12-258-B  
**Weber, Carolina Brandt** (Frau Carl von Weber), 12-282  
**Weber, Constance** (Frau Wolfgang Mozart), 12-268, 269  
**Weber, Franz Anton von**, baron, 12-281  
**Weber, Wilhelm Eduard**, 10-95  
**Weber River**, U. S., 8-396  
**Webster, Daniel**, life, main article, 12-†523-24  
 birthplace, 8-†238  
 candidate for president, 7-222  
 Dartmouth graduate, 8-242  
 death, 7-†248  
 portrait, 12-†523  
 reply to Hayne, 7-225  
 "Seventh of March Speech," 7-247  
 Whittier's "Ichabod" aimed at, 13-307  
**Webster, Noah**, portrait, 10-†24  
**Webster, Thomas**, picture by, 12-†245  
**Webster-Ashburton Treaty**, 7-236  
**Weddell, James**, Antarctic expedition, 13-506  
**Weddell Sea**, Antarctica, map, 13-502-B  
**Weddell seal**, 4-†328  
**Wedge**, mechanics, 1-†325, †326, 331  
**Wedgewood, Emma** (Mrs. Charles Darwin), 13-435  
**Wedgewood, Josiah**, pottery made by, 12-61  
**Wednesday**, origin of name, 6-205  
**Wee bush tit**, bird, 4-62, 63  
**"Wee Willie Winkie,"** by Rudyard Kipling, 13-269  
**Weeds** poisonous to animals, 2-205  
**Weehawken**, N. J., commuter traffic, 8-248  
**Week days**, how named, 10-483  
**Weeks**, in various calendars, 10-482  
**Weeper monkey**, 4-263  
**Weeper's Corner**, part of New York City, 8-266  
**Weeping warrior crab**, 3-180  
**Weeping willow**, tree, 2-†157, 159  
**Weevil**, beetle, 3-338  
**Weft**, in weaving, *see* Woof  
**Weight**, main article, 1-†467-74  
   determined by gravitation, 1-†302, 303  
   difference between mass and, 1-303  
   distinction between weight and mass, 1-303  
   earth's; how ascertained, 1-16  
   compared with sun, 1-†112  
   greater at Poles than at Equator, 1-16  
**Weight chart for children**, 2-363  
**Weighting of silk**, 9-43  
**Weights and measures**, main article, 10-†370-77  
   Sumerian, 5-82  
**Weimar**, Germany  
   German constitution adopted at, 6-240  
   Goethe's work in theater, 12-332  
   literary center, 13-276, 277, †279, 282  
   musical center, 12-298  
**Weisia viridula**, moss, 2-†85  
**Weizmann, Chaim**, Israeli president, 5-†141  
**Weizmann Institute of Science**, Israel, 5-†141  
**"Welcome,"** William Penn's ship, 12-461  
**"Welcome Stranger,"** gold nugget, 9-394  
**Welding**, invented, 12-3  
**Welf**, *see* Guelphs  
**Welfare work**, *see* Social welfare work  
**Well**, *see* Wells  
**"Well-tempered Clavichord, The,"** by J. S. Bach, 12-†231, 262  
**Welland Canal**, Canada, 10-274  
**Weller, Sam**, in Dickens' novel, 13-†244  
**Wellesley, Arthur**, *see* Wellington, Arthur  
   Wellesley, first duke of  
**Wellesley, Richard Colley Wellesley**, marquis, 12-433, 434; 5-382  
**Wellesley College**, Wellesley, Mass., building, 8-†169  
**Wellhead**, sculpture by Claus Sluter, 11-†103, 105  
**Wellington**, New Zealand, made capital, 5-539  
**Wellington, Arthur Wellesley**, duke of, life, main article, 12-†433-35  
   Battle of Waterloo, 12-433, †435; 6-89

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Wellington, Arthur W.—continued**

- India, 12-433
- meeting with Nelson, 12-\*434
- Peninsular War, 12-434; 6-88, 342
- portraits, 6-\*89; 11-318
- ships named for, 9-56
- tomb, 11-318

**Wellman, Walter**, attempts to reach North Pole, 13-501

**Wells, H. G.**, quoted, 2-367

**Wells**

- artesian, 1-90, \*91
- location and source of, 1-†90, \*91
- value to man, 1-89

**Welsbach mantle**, 10-†390

**Welsh, Jane** (Mrs. Thomas Carlyle), 13-235

**Welsh language**, 6-140

**Welsh literature**, 6-139, 140, 141

**Welsh National Eisteddfod**, 6-†136, 139, \*140, 141

**Wenatchee**, Wash., apple growing; spring blossom festival, 9-163

**Wends**, Slavic people, 6-238

- Christianity accepted by, 6-410
- musical instrument, 12-\*226

**Wentworth, Benning**, governor of New Hampshire, 8-401

**Wentworth, Thomas**, *see* Strafford, Thomas

Wentworth, earl of

**Wertheimer, Asher**, children of, portraits by

Sargent, 11-\*362

**"Werther, The Sorrows of,"** by Goethe, 13-281

**Weser River**, Germany, Münden to North Sea, 10-257

length, 10-253

map, 6-582

**Wesley, Charles**

a founder of Methodism, 13-549, 550

leads religious revival, 6-79

**Wesley, John, life and preaching**, main article, 13-†549-50

leads religious revival, 6-79

Southey's life of, 13-220

**Wesleyan movement**, 13-549

**Wesleyan University**, Middletown, Conn., agricultural experiment station, 7-456

**Wessex**, England, Thomas Hardy's novels of, 13-264

**West, Benjamin**, American painter

death of General Wolfe depicted, 7-\*142

president of the Royal Academy; art, 11-354

style compared with Turner's, 11-312

**West, Richard**, friend of Thomas Gray, 13-203

**West, the**, section of United States, 8-448

days of westward migration, 7-214-16, †230-39

frontier life, 7-215; 9-†318; 12-555-I

memorials of Spanish days in Southwest, 7-\*234

settlement, 7-280

sheep raising, 8-\*450

Southwest won by Mexican War, 7-238

wheat production, 2-180

**West, the—continued**

*see also* Prairies

**West Africa**, description and history, main article, 5-†466-73

costume and headdress, 9-\*4

houses, 12-129

*see also* Africa

**West Allis**, Wisconsin, manufacturing, 8-444

**West Cambridge**, Mass., children's library, 10-558

**West Catskill Aqueduct**, 10-207

**West Florida**, Province of, early name for Mississippi (state) region, 8-201

**West India Company**, 7-128; 8-272

**West Indian shark**, 3-\*199

**West Indies**, islands, Caribbean Sea, description and history, 7-†50-53, †62-66

animal life

birds

kingfisher, 4-50

parrot, 4-192

veery, 4-54

lizards, 3-449, 452

Columbus' discovery, 7-116

European control, 7-51, 53, 54, 57, 62 fol.

**Greater Antilles**, 7-†53-59, \*51, 60

**Lesser Antilles**, 7-†62-66

maps, 7-601

on map of World, 5-572

pirates, 7-†50, 53

political divisions, 7-33-N

products and industries

bananas, 9-180

phosphates, 1-97

Spanish cedar, 9-258

sugar, 7-51

racas, 7-†52-58, 60, †62-66

slavery, 7-51, 54, 57

United States, possessions and protectorates, 7-51

Cuba, 7-56, 297

Haiti, 7-57

Porto Rico, 7-59, 297, 307

Samoa, 8-474

Santo Domingo, 7-58

Virgin Islands, 7-53, 62, 8-474

*see also* British West Indies

**West Point**, N. Y.

in Revolutionary War

Benedict Arnold's effort to betray, 12-485, 487

fort, 7-479

**U. S. Military Academy**, 7-\*479-B

appointments, 7-479-D

cadets, 7-479-D-79-F

famous graduates, 7-479-D; 12-555-F, 555-I

moral code, 12-555-F

reorganized by MacArthur, 12-555-J

**West Quoddy Head**, Maine, easternmost point in U. S., 8-156

**West River**, China, *see* Si River

**"West-Running Brook,"** poem by Frost, 13-349

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- West Texas Military Academy**, 12-555-I
- West Virginia**, state, U. S., description and history, main article, 8-†430-36; general data, 8-436-A-436-B
- agriculture, 8-436
  - area, 8-436-A
  - capital and capitol building, 8-\*430
  - charities and correction, 8-436-A
  - chemical plant, 10-\*558
  - cities, towns, list, 8-436-B
  - chief industrial, 8-435
  - climate, 8-436-A
  - compared to Virginia, 8-433
  - counties, 8-436-B
  - education, 8-436
  - institutions of higher learning, list, 8-436-A
  - flag, 8-436-B
  - history, 8-431
    - admitted to Union, 8-434
    - Civil War, 8-433
    - Revolutionary War, 8-432
    - separates from Virginia, 8-433
  - holidays, 8-436-B
  - Indians, 8-432
  - map, 8-552
    - on United States map, 7-595
  - motto, 8-436-B
  - name, 8-436-A
  - nicknames, 8-436-B
  - people, 8-433
  - physical features, 8-436-A, 430
  - political facts, 8-436-A
  - products and industries, 8-435-36
    - coal, 8-435, 436
    - lumber, 8-\*434, 435
    - petroleum, 8-\*433
  - rivers, 8-430, 436-A
  - state bird, 8-436-B
  - state park, 8-\*431
  - state song, 8-436-B
  - transportation, 8-434
  - wild life, 4-\*93
- "West Virginia,"** U. S. warship, 7-\*481
- "West Virginia Hills,"** song, 8-436-B
- "West Wind, Ode to the,"** by Percy Bysshe Shelley, 13-229
- Westbrook, Harriet** (Mrs. Percy Bysshe Shelley), 13-228
- Westerlies, prevailing** (winds), 1-225
- discovery, 5-547
  - effect on rainfall, 1-255, 256
- Western Australia**, state, 5-554, 556, 558
- member of Commonwealth of Australia, 5-560-L
- Western church**, *see* Roman Catholic church
- Western Cordillera**, mountain chain, South America, 5-518-A
- Western grebe**, bird, 4-\*107
- Western Hemisphere**, 5-518-B
- Western Islands**, *see* Hebrides
- Western meadow lark**, 4-87
- Western meadow lark—continued**
- state bird of
    - Nebraska, 8-228-A
    - Oregon, 8-332
- Western Peak**, mountain, Jamaica, 7-55
- Western Reserve**, 8-306
- Western Shore of Maryland**, 8-162-A
- Western Tennessee Plain**, 8-367
- Western Union Telegraph Company**, refusal to buy Bell's telephone patents, 10-112
- Western Upland**, elevated region, Wis., 8-446
- Westinghouse, George**
- invents air brake, 10-196
  - portrait, 10-\*200
- Westminster, Vt., "Westminster Massacre,"** 8-401
- Westminster, Statute of**, 7-29-A
- Westminster Abbey**, London, 11-\*472, †475
- built by Henry III, 6-25
  - Coronation Chair, 12-†182
  - Henry VII's Chapel, 11-475
  - Poets' Corner, 11-\*476; 13-144
- Westminster Cathedral**, London, mosaic work, 12-\*112
- Westminster Massacre**, 8-401
- "Westover,"** mansion, Virginia, 11-507
- Westphalia, kingdom of**, created by Napoleon, 6-226
- Westphalia, Peace of**, 6-214
- effect on Hapsburg power, 6-263
  - Mazarin's influence, 6-181
  - Sweden's gains, 6-401
  - Switzerland gains independence, 6-252
- Westsylvania**, name proposed for Virginia, 8-433
- "Westward Ho!"** by Charles Kingsley, 13-247
- Westward movement**, *see* West, the
- Wet-and-dry-bulb thermometer**, 1-393
- Wetbird** (chaffinch), 4-172
- Wethersfield, Conn.**, founding, 8-56
- Weyden, Roger van der**, life and paintings, 11-199-200, 202
- "Descent from the Cross," painting, 11-\*197
  - "St. Luke Making a Portrait of the Virgin," painting, 11-\*198
- Weyler y Nicholau, Valeriano**, marquis of Tenerife, in Cuba, 6-334
- Weymouth, George**, exploration, 8-151
- Whale**, constellation, star maps:
  - Jan. and Feb., 1-178-B
  - Nov. and Dec., 1-178-L
  - Sept. and Oct., 1-178-J
- Whale oil**, 4-441, 446
- used for lamps, 7-145
- Whale shark**, 3-\*199
- Whalebone**, 4-445, \*446
- Whalebone (right) whale**, 4-\*443, 445, 447
- Whales**, main article, 4-†441-48
- ambergris found in, 4-446; 9-302
  - anatomy, 4-442, 445, 447
  - blubber, 4-444, 446, 448
  - descent from land-dwelling animals, 4-442
  - dolphin and porpoise relatives of, 4-448

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Whales—*continued***

in Tertiary period, 3-52  
 largest living animals, 4-445, 447  
 schools, 4-445  
 sperm, 3-171, †172  
 "spermaceti," 4-446  
 spouting, 4-445  
 toothed and whalebone whales, 4-445 fol.  
**Whaling industry**, 4-\*441, \*447, 448  
 Alaska, 8-12  
 colonial times, 7-150  
 New London, Conn., 8-59  
 Rhode Island, 8-344  
**Wharton, Edith**, American novelist, 13-346  
 background of period, 7-335  
 portrait, 13-\*351  
**What did I see**, game, 14-161  
**"What Every Woman Knows,"** by Sir James  
 Barrie, 13-268  
**"What hath God wrought!"** first telegraphic  
 message, 10-98  
**"What is Man?"** by Mark Twain, 13-330  
**"What Men Live By,"** by Count Leo Tolstoy  
 13-92  
**"What Price Glory,"** by Maxwell Anderson  
 and Laurence Stallings, 13-355  
**What to do**, *see* Things to do  
**Whatnot**, furniture, 11-512  
**Wheat**, main article, 9-†97-102  
 by-products, 9-101-2  
 cleaning of, 9-234  
 cross section, 2-\*31  
 "dry farming," 7-456  
 on U. S. plains, 7-279, †280  
 fruit, 2-\*118  
 fungus diseases, 9-100; 2-138, †140  
 hard spring wheat belt, 8-300  
 harvesting, 9-\*97, \*100, 101  
 hand, 10-409  
 machinery, 10-\*411, 412  
 planted in America, 7-454  
 planted in New Stone Age, 5-35  
 producing regions, 9-98, 101  
 Arctic Circle, Northern Canada, 7-\*29-T  
 Australia, 5-\*560-B, 560-R  
 Canada, 7-29-T, 29-X  
 United States, 7-343-E  
 Idaho, 8-\*90, 91  
 Kansas, 8-129  
 Minnesota, 8-190, 195  
 Montana, 8-219  
 North Dakota, 8-†300, 301  
 high quality, 8-301  
 Ohio, 8-309  
 Oregon, 8-329  
 spring and winter, 9-98  
 spring wheat most popular, 8-120  
 standard of excellence by which all wheat is  
 judged, 7-29-T  
 varieties, 9-98, 100  
*see also* Flour and flour mills  
**Wheat elevator**, 9-\*236

**Wheat rust**, 2-138, †140; 9-100  
**Wheat State**, 8-198-A  
**Wheatstone, Charles**, 10-96  
**Wheel, broken**, symbol of St. Catherine, 13-527  
**Wheel and axle**, mechanical principle, 1-\*325,  
 \*326, †330  
**Wheel urchin**, 3-137  
**Wheelbarrow**, invented by Leonardo da Vinci,  
 11-151  
**Wheels**  
 drivewheels in escalator, 1-\*337  
 invention; importance, 1-320  
 separating rim from, 1-479  
 vehicles with wheels, 10-†142-48  
 water, 1-370, \*505; 10-\*398  
**Wheelbarrow race**, game, 14-168  
**Wheeler, William A.**, vice president of the  
 United States, 12-456-G  
**Wheeler, Mount**, Nevada, 8-234-B  
**Wheeler Dam**, 8-371  
**Wheelhouse**, on bridge of liner, 10-\*457  
**Wheeling, W. Va.**, industries, 8-435  
**Whelk**, mollusk, 3-\*142, †143, 146, †147, \*148, 149  
**Whelps**, nickname for natives of Tennessee,  
 8-374  
**"When lilacs last in the dooryard bloomed,"**  
 poem by Walt Whitman, 13-327  
**"When the Morning Stars Sang Together,"**  
 drawing by William Blake, 11-304  
**"Where are the snows of yesteryear?"** poem by  
 François Villon, 13-105  
**Where is my nose**, game, 14-159  
**"Where the Columbine Grows,"** song, 8-52-B  
**Whey**, in cheese making, 9-344, 346  
**Whidby Island**, Wash., 8-428  
**Whigs**, political party  
 England  
 name changed to Liberals, 6-95  
 origin of party, 6-72  
 quarrels with Tories over reforms, 6-93  
 splitting into factions, 6-81  
 United States, 7-228  
 disintegration, 7-250  
**"While I breathe, I hope,"** motto of South Caro-  
 lina, 8-356-A  
**Whip grafting**, 2-\*231  
**Whip-tailed sting ray**, fish, 3-\*198  
**Whippet**, dog, 4-\*497  
**Whippoorwill**, bird, 4-†76  
 compared with nighthawk, 4-98  
**Whirligig beetle**, 3-†397  
**Whirlwind**  
 cyclone, 1-228, 277  
 tornado, 1-\*229, 230  
**Whisk brooms**, made from broom corn, 9-314,  
 315  
**Whiskers**, sense organs of cat, 4-485  
**Whiskey Rebellion**, 7-196  
**Whispering Gallery**, St. Paul's Cathedral, 11-493  
**Whistle** how to make, 14-†32  
**Whistler, James Abbott McNeill**, 11-358-59  
 a rebel in art, 11-358

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Whistler, James A. McN.—continued**

- 1 attacks Turner, 11-314
- criticizes Pre-Raphaelites; brings suit against Ruskin, 11-320
- etching, 10-65
- paintings
  - portrait of his mother, 11-\*353, 359
  - "Portrait of Miss Alexander" or "Harmony in Gray and Green," 11-320, \*357
  - "Portrait of Miss Connie Gilchrist" or "The Gold Girl: a Harmony in Yellow and Gold," 11-\*357
- Whistling buoys, 10-\*227
- Whistling jars, 12-\*202
- Whistling swan, bird, 4-113
- Whitby, England, jet rosaries, 9-444
- Whitby, Council of, 6-10
- White, Chandler, portrait, 10-\*101
- White, John, governor of Roanoke Island, 8-286; 13-480
- White, Maria (Mrs. James Russell Lowell), 13-313
- White, Peregrine, 8-166
  - cradle, 12-\*198
- White, Stanford, association with artists, 11-364, 368
- White, how produced, color plate, 1-434
- White admiral butterfly, 3-276
- White ants, *see* Termites
- "White Army" of Russia, 6-441
- White ash, tree, 2-\*276
- White-breasted nuthatch, 4-†125, 126, \*129
- White-capped tanager, bird, 4-180
- "White Captive," statue by Erastus W. Palmer, 11-\*375
- White cat, variety of cat, 4-488
- "White Cat," fairy tale, text, 14-†208-10
- White cedar (arbor vitae), use of wood, 9-258
- "White City," World's Fair, Chicago, 1893, 11-514
- White corpuscles, 2-\*346, 347, 349
- White-crowned sparrow, bird, graph of song, 4-\*5
- White curlew (ibis), bird, 4-147
- White dye, 12-157
- White elephant, sacred beast, found in Siam, 5-430-A
- White-eyelid monkey, 4-\*253, 254
- White-faced glossy ibis, 4-\*148
- White-faced tree duck, 4-\*121
- White-footed mouse, 4-384
- "White" or arctic fox, 4-†305-6
- White gannet, bird, 4-\*214
- White gold, 9-392
- White Grotto, 1-87
- White Guards, in Finland, 6-457
- White gyrfalcon, 4-\*153
- White heron, bird, 4-146
- White Horse, town, Canada, 8-16
- White Horse Vale, Battle of, 10-10
- White House, treasury of Egypt, 5-51

- White House, Washington, D. C., 11-511, \*513; 12-\*558
  - First Ladies, 12-†558-64
  - first occupation of, 12-560
  - set on fire by British, 12-\*561
- White ibis, bird, 4-147, \*148
- White light, separation of colors in, color plate, 1-434, 438
- White man's burden, 5-386; 6-101
- White Mountain National Forest, 8-242-A
- White Mountain National Forest Reservation, 8-242-A
- White Mountain State, nickname for New Hampshire, 8-242-B
- White Mountains, N. H., 8-242-A, \*236
- White Nile, river, Africa, 5-455, 473-A
  - floating islands, 2-264
- White oak, 2-160, \*271
- White Oak Mountains, Georgia, 8-84
- White of the eye (sclera), 2-†296, 300
- White pine, 2-\*266
  - extreme age, 2-260
  - uses for wood, 9-258
- White-pine blister rust, 2-141
- White Plains, N. Y., national monument, 8-284-A
- White race, 5-†43-45
- White River, Arkansas, 8-30-A; 10-255
- White River, Colorado and Utah
  - Colorado, 8-52-A
- White River, Ind., 8-116
- White River, Nebraska and South Dakota, 8-359
  - South Dakota, 8-364
- White Russia, 6-443-B
- White Sands National Monument, 8-262-A
- White Sea, Russia
  - link with Baltic, 10-261
  - maps, 6-600, 571
  - Russian irrigation project, 10-261
- White shark, 3-198
- White Star Line, steamers, 10-223
- White-tailed deer, 4-407
- White-tailed kite, bird, 4-157
- White-tailed ptarmigan, bird, 4-230
- White-throated sparrow, 4-126, †127, \*85
- White Wall, of Egypt, 5-52, 56
- White (beluga) whale, 4-446
- White-winged crossbill, bird, 4-130
- White wood (tulip tree), 2-\*273
- Whitefield, George, joins Wesleys' revival, 6-80
- Whitefish, 9-368
  - Lake Superior, 8-445
- Whitesbog, N. J., center of blueberry and cranberry industries, 8-246
- Whitewater River, U. S., 8-116
- Whitman, Marcus, 10-148
  - settlement in Oregon, 7-232
- Whitman, Narcissa (Mrs. Marcus Whitman), 7-232
- Whitman, Walt, life and works, main article, 13-326-27

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Whitman, Walt**—*continued*  
 faith in democracy, 7-283  
 friendship with Burroughs, 13-426  
 portrait, 13-326
- Whitney, Eli**, 10-406 fol.  
 invents cotton gin, 10-406; 7-217  
 portrait, 10-404
- Whitney, Mount**, Calif., 7-420, \*404  
 height, 8-33
- Whitney elk**, 4-\*407
- Whittier, John Greenleaf**, life and works, main  
 article, 13-†306-7  
 opinion of Webster, 7-247  
 portrait, 13-\*306, \*308
- Whittington, Richard (Dick)**, Lord Mayor of  
 London, generosity, 6-\*35
- Who is it**, game, 14-164
- "Who is Sylvia?"** by Franz Schubert, 12-244, 285
- Who stole my horse**, game, 14-154
- Whole-tone scale**, 12-318
- Whooping crane**, bird, 4-\*105
- Whorls**, botany, 2-97, 132
- Wichita**, Kansas  
 industries, 8-130  
 temperature, 8-131
- Wichita Indians**, Oklahoma land grant, 8-317
- Wichita Mountains**, Oklahoma, 8-316
- Wichita Mountains Wild Life Research Station**,  
 8-320-B
- "Wick"**, meaning, 8-66-A
- Wicker**, *see* Baskets and basket-making
- Wicket**, used in cricket, 2-\*360
- Wicks**, lamp and candle, 10-389
- Widow bird**, 4-182
- "Widow in the Bye Street, The,"** by John  
 Maschfeld, 13-270
- Widow spider**, black, 3-\*413
- "Widowers' Houses,"** by G. B. Shaw, 13-271
- Widows**  
 burning of, in India, 5-375, 383  
 mourning of Arabian widows, 5-\*420
- Widows Island Migratory Bird Refuge**, Maine,  
 8-156-A
- Wieck, Clara** (Mrs. Robert Schumann), 12-289,  
 290
- Wieck, Friedrich**, and Robert Schumann, 12-  
 289, 290
- Wieliczka**, Poland, salt mines and city, 9-\*414
- Wiesbaden**, Germany, in Roman times, 6-\*205
- Wife of Bath**, character in Chaucer's "Canter-  
 bury Tales," 14-330
- Wig**, powdered, 9-20
- Wightman, Mrs. George W.**, 14-470
- Wightman cup**, tennis trophy, 14-470
- Wiglaf**, in Beowulf legend, 14-322
- Wigwam**, Indian dwelling, 7-99, \*100; 11-\*397;  
 14-\*557  
 distinguished from tepee, 8-360
- Wilbur Cross Parkway**, Connecticut, 8-61
- Wilcressen**, *see* Flickers
- Wild apricot**, *see* Passion flower
- Wild boar**, 4-432, \*436
- Wild canary** (yellow warbler), 4-59; 6-490-91  
 color plate, 4-\*25  
 yellow warbler, 4-83
- Wild cats**, *see* Cats
- Wild dogs**, 4-†306-7, \*308; *see also* Dog family
- "Wild Duck, The,"** play by Ibsen, 12-333
- Wild goats**, 4-425, \*427, †428-30  
 horns, 4-\*423  
 similarity to wild sheep, 4-425
- Wild horses**, 4-\*349, 350
- Wild life**, conservation, 7-405; 4-516  
 Alaska, 8-16-A, 16-B  
 birds, 4-†516-18; 13-428  
 buffalo, 7-279  
 seals, 4-331  
*see also* subhead reservations under various  
 states
- "Wild man from Borneo,"** savage, 5-524
- "Wild man of the woods"** (orang-utan), 4-†247
- Wild Men**, group of artists, 11-390, 392
- Wild orchid**, 8-198-A
- Wild rose**, 2-\*165, \*227  
 perfect, or complete, flower of, 2-102
- Wild sheep**, 4-†425-28  
 horns, 4-\*421
- "Wild Swans,"** fairy tale, text, 14-†211-13
- Wild West**, *see* West
- Wild West shows**, 12-573, 574
- Wildcat Mountains**, Nebraska, 8-228
- "Wildcat" oil wells**, 9-451
- Wildebeest** (gnu), 4-†422
- Wilderness**, Battle of the, 7-264
- Wilderness Road** into Kentucky, 12-†471; 8-135
- Wildspitze**, mountain peak, Austria, 6-265
- Wilhelm**, *see* William
- "Wilhelm Meister,"** by Goethe, 13-283  
 Carlyle's translation, 13-236
- Wilhelmina I**, queen of the Netherlands, 6-355
- Wilkes, Charles**, Antarctic expedition, 13-506
- Wilkie, Sir David**, painting by, 13-\*293
- Wilkins, Sir Hubert**, Arctic flight, 13-502
- Wilkinson, James, General**, part in develop-  
 ment of Kentucky, 8-136
- Willamette meteorite**, 1-\*161
- Willamette River**, Oregon, 8-331
- Willamette River Valley**, 8-325  
 climate, 8-331  
 fruit growing, 8-\*326  
 settlement, 8-326
- Willet, Marinus**, part in Revolutionary War,  
 7-162
- William I**, German emperor, 6-220  
 and Bismarck, 12-448  
 character, 6-233  
 crowned, 6-†231  
 portrait, 6-\*228  
 viewing Vienna, 6-\*227
- William II**, German emperor, 6-234  
 and Bismarck, 6-\*233, 234; 12-449  
 and Theodore Roosevelt, 12-546  
 Dutch minister's reply to, 6-355

The asterisk (\*) refers to picture and its explanation only. The obeliak (†) refers to illustrated text.

- William II—continued**  
 ? grandson of Queen Louise of Prussia, 12-428  
 portrait, 6-\*234
- William I, the Conqueror**, king of England, 6-14, 19  
 Bayeux tapestry made by queen of, 1-\*162  
 brings Norman influence to England, 10-11  
 Domesday Book, 6-20  
 grants charter to London, 6-\*19  
 ownership of England, 6-83
- William II**, king of England, 6-20
- William III**, king of England, 6-†74, 75  
 arrival in England, 6-72  
 attitude toward Ireland, 6-155, 161  
 Connecticut's charter restored, 8-57  
 Dutch fleet reviewed by, 6-353  
 offered English crown, 6-72  
 opposes Louis XIV, 6-184
- William IV**, king of England, 6-90  
 establishes throne in affections of people, 6-92  
 forces Lords to pass Reform Bill, 6-94  
 instructed in naval tactics, 12-421
- William I**, king of Prussia, *see* William I, German emperor
- William I, the Lion**, king of Scotland, 6-112
- William I, the Silent**, prince of Orange  
 Antwerp saved by, 6-350  
 leads Reformation in Holland, 6-354
- William**, duke of Bavaria, patron of art, 11-193, 196
- William and Mary**, *see* William III, king of England and Mary II
- William and Mary College**, Williamsburg, Va., 8-417; 10-556
- William, Fort**, headquarters for fur traders, 10-139
- William Henry of Nassau**, prince of Orange, *see* William III, king of England
- William of Sens**, early French architect, 11-473
- William and Mary furniture**, 12-\*191, 192
- William Rockhill Nelson Gallery and Atkins Museum of art**, 8-212-A
- "William Tell"**  
 drama by Schiller, 12-375; 13-279  
 opera by Rossini, 12-253
- Williams, Roger**, founds Rhode Island, 8-343
- Williams, Vaughn**, 12-257
- Williams Bay**, Wis., Yerkes Observatory, 1-110, \*154, \*189
- Williams College**, Williamstown, Mass., 8-175
- Williams River**, Arizona, 8-24
- Williamsburg**, Va.  
 historical significance, 7-412, 414  
 William and Mary College, 8-417
- Williamson's sapsuckers**, birds, 4-\*73
- Williamstown, Mass.**, average winter temperature, 8-176-A
- Willimantic, Conn.**, 8-60
- Willkie, Wendell**, 7-343
- Willoughby, Sir Hugh**, 13-499
- Willow Creek Bird Refuge**, 8-220-A
- Willow family**, 2-\*157, 158
- Willow pattern**, legend of, 12-†59 \*
- Willow ptarmigan**, bird, 4-229
- Willow warbler**, bird, 4-\*174
- Willow wren**, 4-175
- Wills, Helen** (Mrs. F. S. Moody, Jr.), 14-\*464, 466
- Wills, William John**, exploration in Australia, 5-\*553
- Will's Coffee House**, London, 13-†173
- Wilmington, Del.**, 8-66  
 temperature, 8-66-A  
 marine terminals, 8-\*65  
 site of Christinham, 8-64
- Wilmington, N. C.**, 8-289, 294
- Wilmot, Lemuel Allan**, reform hero of New Brunswick, 7-19
- Wilmot Proviso**, 12-456-E
- Wilson, Allen B.**, 10-444
- Wilson, Edith Bolling Galt** (Mrs. Woodrow Wilson), 12-564
- Wilson, Ellen Louise Axson** (Mrs. Woodrow Wilson), 12-564
- Wilson, Henry**, vice president of the United States, 12-456-G
- Wilson, J. H.**, General, capture of Jefferson Davis, 8-81
- Wilson, James**, 12-496
- Wilson, John Q.**, quoted, 10-222
- Wilson, Richard**  
 landscape paintings, 11-298, 311  
 quoted, 11-300
- Wilson, Thomas Woodrow**, president of the U. S., biography, main article, 12-†548-53, 456-E  
 administration: World War I, 12-549-53; 7-314-28  
 and cabinet, 12-\*549  
 at Paris peace conference; efforts for a League of Nations, 12-552; 7-327, 328  
 attitude toward Germany, 6-238  
 birthplace, 12-\*553  
 elected in 1912, 7-312  
 liberal ideas: policies of the "new freedom," 12-549; 7-312  
 made governor of New Jersey, 12-549  
 Mexican policy; stand for neutrality, 12-550; 7-316  
 opposes Italian claims, 6-310  
 portraits, 12-\*548 fol.; 7-\*316  
 reelected, 7-320  
 reforms at Princeton University, 12-548  
 vetoes Volstead Act, 7-336
- Wilson, William B.**, portrait, 12-\*549
- Wilson Dam**, Tennessee River, 7-\*499; 8-371  
 part of TVA project, 8-368
- Wilson's Creek, Battle of**, 8-211
- Wilson's plover**, bird, 4-\*115
- Wilson's snipe**, bird, 4-†114
- Wiltberger, Christian**, sugar bowl by, 12-\*91
- Wilton, Gray de Lord**, motto, 8-206-A
- Wilton carpet**, 12-159
- Wimbledon, England**, tennis matches, 14-467

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Winchester, Va.**  
factories, 8-417  
Shenandoah Apple Blossom festival, 8-418-A
- Winchester, Battle of**, 7-\*259
- Winchester Cathedral**, England, 11-475
- Winckelmann, Johann Joachim**, "History of Art of Antiquity," 11-288
- Wind**, *see* Winds
- Wind Cave National Park**, South Dakota, 8-364-A; 7-409
- Wind gauge**, how to make, 14-†48
- Wind instruments**  
earliest, 12-203  
pitch variation, 1-449
- Wind of 120 Days**, 5-106
- Wind River Mountains**, Wyoming, 8-454
- Wind River Indian Reservation**, 8-454-A
- Windmills**, 6-\*344, \*345, 352, \*402, \*409  
Ile-aux-Coudres, Quebec, 7-\*8
- Window box**, how to make, 14-†50
- Window glass**, 10-548
- "Window in Thrums, A,"** by Sir James Barrie, 13-268
- Windows**  
cathedral and church, 11-454, 457, 462, \*463  
clerestory, 11-442  
early English, 11-\*474  
of glass, 9-386; 12-27, 36  
mosaic panels, 12-71  
stained glass, *see* Stained glass
- Windpipe** (trachea), 2-\*334, \*335, \*352
- Winds**, main articles, 1-†222-32  
as source of energy, 1-352  
for rotor ship, 1-\*508  
for sailing vessels, 10-160  
for windmill, 1-\*227  
to turn dynamos, 1-†508  
as weather prophets, 1-267  
bise, 6-254-B  
bora, 6-290-A  
Bryce Canyon chiseled by, 7-409  
California affected by, 8-40  
caused by air currents, 1-†222-25, 399, 483  
"chinook," 1-231; 7-29-U  
courses taken by vessels, 10-239  
cyclones, 1-228, 277  
desert winds, 1-231, †232; 5-470; 6-491  
designs drawn on desert, 1-\*195  
"doldrums," belt of calm, 1-225  
erosion caused by, 7-469  
föhn, 6-254-B  
Greek mythology, 14-433  
"horse latitudes," 1-225  
Kosava, 6-290-A  
meters for measuring speed of, 1-\*274, 276  
"mistral," 1-231  
moisture in, unable to cross Rocky Mountains, 1-255, 256  
"monsoon," 1-231  
pollen carried by, 2-111, 113, 145  
relation to rainfall, 1-246  
prevailing westerlies, 1-255, 256
- Winds—continued**  
robs land of soil, 7-466  
seeds and fruits scattered by, 2-†210-12  
Shamal, 5-106  
tornadoes, 1-\*229, 230  
"trades," 1-225  
typhoons and hurricanes, 1-†230
- Windsor, Conn.**, founding, 8-56
- Windsor, house of**, 6-74
- Windsor Castle**, England, 10-356
- Windsor chairs**, 12-198
- Windward Islands**, West Indies, description, 7-64-66; general data, 7-34-B  
map, 7-601
- Wine**  
California grapes grown for, 8-\*35; 9-168  
Hungarian, 6-287  
Madeira, 6-490  
Port, 6-342-A
- Wine cooler**, English, 12-\*194
- Wine cup**, Chinese, 12-\*15
- Wine industry**, of France; saved by Pasteur, 13-367
- "Wine of Circe, The,"** painting by Burne-Jones, 11-\*318
- Wine pitcher** (oinochoë), 12-50
- Wineglasses**, 12-\*33, 34
- "Winesburg, Ohio,"** by Sherwood Anderson, 13-351
- Wing**, *see* Wings
- Wing cases**, insect  
beetle, 3-329, †330, \*341  
katydid, 3-349  
sound production by, 3-345
- Wing fans** of lizard, 3-450
- Wing-footed mollusk**, 3-148
- Wing shells**, 3-144, 160
- Winged Victory** (Victory of Samothrace), sculpture, 11-55, \*56
- Winged wolf** (harpy eagle), 4-153, \*154
- Wingfield, Walter**, game patented by, 14-467
- Wings**, of animals  
bat, 4-271  
flightless birds, 4-†218, 232, 238  
insect, 3-273  
bees, 3-299  
beetles, 3-329, †330, \*341  
butterflies, 3-281, 287; 10-\*489  
flies, 3-357  
leaping insects, 3-346  
mantid, 3-349  
moths, 3-287  
straight-winged, 3-354, 370
- Wings**, of airplane, 10-\*328-K, 328-II, 328-M-28-C)
- Wings**, petals of flowers, 2-166
- Winkelried, Arnold von**, 6-248
- Winnebago, Lake**, Wis., 8-446
- Winnebagos**, Indian tribe, 8-440  
Illinois, 8-99
- Winnemucca**, city, Nevada, temperature, 8-234-A

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



- Winnemucca Lake, Nevada, 8-231  
 Winnepesaukee, Lake, N. H., 8-238  
 "Winning of the West, The," by Theodore Roosevelt, 12-543  
 Winnipeg, Canada, 7-29-U, \*22, \*7, 33-B  
   temperature, 1-211; 7-33-A  
 Winnipeg, Lake, Manitoba, Canada, map, 7-592  
   discovery, 7-\*7  
   during Ice Age, 1-61  
 Winnipeg-Nelson river basin, area, 10-257  
 "Winnower, The," painting by Millet, 11-337  
 Winnowing, primitive method, 7-\*452  
 Winooski River, Vt., 8-404  
 "Winsome Winnie," by Leacock, 13-580  
 Winstanley, Henry, the bravest lighthouse builder, 12-557  
 Winston, N. C., 8-294  
 Winston-Salem, N. C., 8-294  
 Winter, a season, 1-\*201, \*203, \*206, 209-10  
   effect on animals' coats, 4-305, \*354, \*355, 356  
   in Greek mythology, 14-416; 9-118  
   position of sun during, 1-†111  
   superstitions about, 14-581  
 Winter, Ezra, painting of Battery by, 10-\*216  
 "Winter," painting by Rockell Kent, 11-\*371  
 Winter forests, 2-196  
 Winter (cardinal), 4-133  
 Winter resorts, *see* Resorts  
 Winter sports, *see* Sports and games  
 Winter wheat, 9-98  
 "Winter's Tale, The," by Shakespeare, 13-158, \*160  
 "Winterset," drama by Maxwell Anderson, 13-355  
 Winthrop, John, Puritan governor, 7-125  
   quoted, 7-126  
   views, 8-167  
 Wintzler, F. A., gas lighting used by, 10-390  
 Wire-haired fox terrier, 4-\*499  
 Wire photo, *see* Telephotography  
 Wire rope, 9-287  
 Wire Squadron, Atlantic cable laid by, 10-104  
 Wireless telegraph, *see* Radio  
 Wireless telephone, *see* Radio  
 Wires  
   charged, how to release shock victim from, 2-411  
   resistance to electricity, 1-†515  
   telephone, 10-\*108, \*112, 113  
 Wireworm (click beetle grub), 3-338  
 Wisconsin, state, description and history, main article, 8-†438-45; general data, 8-446-446-B  
   agriculture, 8-442, †443  
   area, 8-446  
   birds, 8-445  
   sanctuaries, 8-446-A; 4-517  
   capital, 8-†438  
   charities and correction, 8-446  
   cities, towns, list, 8-443, 444, 446-A  
   climate, 8-446, 442  
   counties, list, 8-446-A  
   education, 8-445  
   Wisconsin, education—*continued*  
     institutions of higher learning, list, 8-446  
     University of Wisconsin, 8-\*440  
   flag, 8-446-A  
   foreign born, 8-442-43  
   fur trade, 8-440, 441  
   glacier, 8-446  
   government, 8-445  
   history, 8-439-43  
     becomes state, 8-442  
   holidays, 8-446-A  
   hunting, 8-445  
   Indians, 8-439-40, †441  
     Black Hawk War, 8-442  
   reservations, 8-446-A  
   interesting facts, 8-446-A  
   lead rush, 8-441  
   location, 8-446  
   map, 8-557  
     on United States map, 7-594  
   motto, 8-446-A  
   name, 8-446-A  
   nicknames, 8-446-A  
   physical features, 8-446, 438-39  
   political facts, 8-446  
   products and industries, 8-438, 443, †444  
     agricultural products, 8-443  
     dairying, 8-\*442, 443, 441; 9-338, 347  
       test for butter fat discovered, 9-342  
     fisheries, 8-444; 9-\*365  
     lead mines, 8-441, 442, 444  
     lumbering, 8-443, \*444; 9-246  
     tobacco raising, 9-223  
   reservations, game and bird, 8-446-A  
   resorts, 8-444  
   rivers, 8-446, 439  
   state bird, 8-446-A  
   state flower, 8-446-A  
   trade, 8-443  
     early fur, 8-440, 441  
   transportation, 8-443  
   "Wisconsin idea," 8-445  
 Wisconsin, University of, 8-438, \*440  
   agricultural research, 8-445  
 "Wisconsin idea," 8-445  
 Wisconsin River, Wis., 8-446, 439  
   discovery, 13-487  
   valley, 8-439  
 Wisconsin Territory, 8-442  
 Wisdom, Socrates' ideal of, 13-3, 5  
 "Wisdom, Justice, and Moderation," motto of Georgia, 8-84-A  
 "Wisdom of Solomon," origin of term, 5-123  
 Wisdom teeth, 2-316  
 Wise Men, the Three, of Bible, 5-\*101, 102  
   Gentile's procession of, 11-\*139, 140  
   Gozzoli's procession of, 11-\*135, 138  
   perfumes brought by, 9-299  
   reliquary for holding bones of, 12-66  
 Witan, Saxon lawmaking body, 6-14  
 Witch, Hallowe'en, 14-†586  
 Witch-hazel, plant, seed dispersal, 2-213

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Witch of Endor**, game, 14-171
- Witchcraft**  
Norway, 6-388  
Salem, 7-\*148
- Witches' brooms**, plant disease, 2-141
- "Witching Hour, The,"** drama by Augustus Thomas, 13-354
- "With Fire and Sword,"** by Henryk Sienkiewicz, 6-450
- Witherings**, Thomas, postal service, 10-87
- Withlacoochee River**, Florida, 8-76
- Wittekind**, Saxon leader, conversion to Christianity, 5-\*287
- Wittenberg**, Germany  
Luther's activities at, 13-542  
Reformation starts at, 6-212
- Wizard Island**, Crater Lake, 7-407
- Wizard of the North** (Sir Walter Scott), 13-222
- Wladislaw I**, king of Poland, reign, 6-447
- Wladislaw II**, king of Poland, establishes Christianity in Lithuania, 6-448
- Wladislaw IV**, king of Poland, 6-450
- Woden** (Odin), god, 6-376, 377  
Christianity replaces worship, 6-381
- Wogan**, John, Irish leader, built up Irish parliament in 1310, 6-119
- Wolf**  
Romulus and Remus nursed by, 5-\*197  
bronze statue of, Rome, 12-†18  
*see also* Wolves
- Wolf**, Tasmanian, a marsupial, 4-\*463, 464
- Wolf River**, Wis., 8-446
- Wolf spider** (Lycosa), 3-\*406, \*412
- Wolfe**, James  
at Heights of Abraham, 7-\*142, 143  
monument at Quebec, 7-142
- Wolfe**, Thomas, American author, 13-352
- Wolff-Ferrari**, operatic composer, 12-258-D
- Wolff of Berlin**, news-gathering agency, 10-70
- Wolfhound**, *see* Borzoi
- Wolfa**, a duckweed plant, 2-250
- Wolfram** (tungsten), element, symbol, atomic no. and weight, 1-\*551; *see* Tungsten
- Wolfram von Eschenbach**, poet, 12-216; 6-211
- Wolsey**, Thomas, cardinal, 6-†43-45; 12-392
- Wolverine** (glutton), animal, 4-†359
- Wolverine State**, nickname for Michigan, 8-186-B
- "Wolverines,"** people of Michigan, 8-186-B
- Wolves**, 4-†298-302  
destruction of sheep by, 9-\*319  
hunting in packs, 4-299  
kinship of dogs and, 4-307, 494  
prehistoric, 3-\*49, 52  
pursuing travelers in Russia, 6-\*423  
wolf of Romulus and Remus, 5-\*197; 12-†18
- Woman suffrage**  
Alaska, 8-16-A  
first countries to grant, 6-390, 457  
Canada, 7-29  
England, 6-103  
Iceland, 6-420
- Woman suffrage—continued**  
New Zealand, 5-540  
Norway, 6-390  
Sweden, 6-407  
United States, 7-312, 336; 12-572
- Wombat**, marsupial, 4-\*465, 466
- Women**  
ancient Greece, 5-155, 170  
appearance in English theater, 12-331  
Babylon, 5-\*85, 86  
China, 5-†318, 325, 336  
employment during Industrial Revolution, 7-438  
first great queen in history, 10-161  
Greek ideal of virtue, 14-453  
India; custom of burning widows, 5-375, 383  
influences that determine fashions for, 9-20, 22, 24, 95  
inheritance reckoned through mother by Malays, 5-524  
J. S. Mill's essay on, 13-239  
legendary rulers of Japan, 5-344  
life in medieval castles, 5-305, †306-7  
Tibet, 5-440  
treatment by East Indians, 5-383  
treatment by Mohammedans, 5-†419-20  
Turkey, 5-413, 414
- "Women at Point Sur, The,"** poem by Robinson Jeffers, 13-353
- Women Appointed for Volunteer Emergency Service** (WAVES), 6-\*521
- Women's Army Auxiliary Corps** (WAAC), 6-\*521
- Women's Auxiliary Ferrying Service** (WAFS), 6-\*521
- Women's Bureau**, United States, 4-381
- Women's Gallery**, in temple at Jerusalem, 5-125
- Women's rights**, 12-571
- Women's Rights Convention**, first 7-244
- Wonder State** (Arkansas), 8-30-B
- "Wonderful One-Hoss Shay, The,"** poem by Oliver Wendell Holmes, 13-309
- Wood**, Grant, artist, painting by, 11-\*392-A
- Wood**, Leonard, administration in Cuba, 7-297
- Wood**, Sidney, 14-466
- Wood**  
artificial, 9-†294  
by-products, 9-†294  
carbon dioxide produced by burning, 2-45  
cork from, 9-†296-97  
decomposed by fungi, 2-74  
food for termites, 3-379  
for dwellings, 9-375, 380  
for paper making, 9-\*275 fol.  
fossil, 3-\*5, 6  
hard, and its uses, 9-257  
structure, 2-\*8  
heated to prevent warping, 9-257  
importance in Elizabethan period, 8-407  
kinds used in furniture making, 12-179 fol., 182 fol.  
mosaics, 12-114  
petrified, 9-315; 2-\*257

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Wood**—*continued*

- \* poor heat conductor, 1-396
- pulp, 9-277
- soft, 9-257; 2-94, 98
- trees valuable for, 2-159
- under magnifying glass, 1-\*2
- varieties that will burn when green, 14-560
- see also* Lumber and lumbering; Xylem
- Wood blocks**, use in printing, 10-48, \*49
- Wood Buffalo National Park**, Canada, 7-409, 29-V
- Wood carving**, 12-\*99
  - African Negro, 12-96, \*98
  - Chinese, 12-†100
  - church decoration and ornament, 12-\*105, 107
  - Egyptian, 12-\*99, 102, \*103, \*106
  - English; Grinling Gibbons, 12-107, 192
  - French, 12-\*105, 107
  - German, 11-206
  - how to make wooden models, 14-†34
  - in houses, 12-107
  - Indian (American); totem poles, 12-†96, \*98; 8-†11
  - inlay, 12-\*99, 102
  - Japanese, 12-100
  - Maori, 5-\*535, \*541
  - mask, 12-98, \*98, 102
  - medieval, 12-107
  - Persian, 12-102
  - Red Paint People, 8-148
  - Renaissance, 12-107
  - Turkish, 12-\*99
- Wood duck**, 4-\*78, 79
  - color plate, 4-\*120
- Wood engraving**, 10-65
- Wood hare**, 4-386
- Wood hewer**, bird, 4-\*68
- Wood ibis**, bird, 4-\*147
  - color plate, 4-\*184
- Wood pewee**, bird, 4-†63-64
  - graph of song, 4-\*5
- Wood pigeon**, 4-174
- Wood pulp**, 9-277, 294; 10-547
  - far-reaching effects of invention, 7-577
  - industry, Canada, 7-28
  - industry, U. S., 7-343-F; 8-153
- Wood rays**, of stem, 2-\*29, 31
- Wood robin** (wood thrush), 4-frontispiece, 53
- Wood sorrel**, sleeping leaf, 2-\*217
- Wood tag**, game, 14-172
- Wood terrapin**, 3-474, \*475
- Wood thrush**, 4-53
  - color plate, 4-\*88
- Wood violet**, 8-106-A
- Wood warbler**, bird, 4-†57-60, †47
- Wood wind instruments**, 12-258, 258-A-258-C
- Woodchuck** (groundhog), 4-\*371
- Woodcock**, bird, 4-†113-14
  - nest, 4-114
- Woodcraft**, 14-†561-68
  - Indian, 14-562, 567
- Woodcuts**, 10-65

- Wooden horse of Troy**, 13-30
- Wooden Nutmegs**, nickname for people of Connecticut, 8-62
- Wooden shoes**, 9-57, 61
- "Woodlanders, The,"** novel by Thomas Hardy, 13-264
- Woodpecker**, bird, 4-†66-73, \*12
  - color plates, 4-\*88, \*89
  - England, 4-174
- Woods**, *see* Forests
- "Woods of Westermain, The,"** by George Meredith, 13-263
- Woodsman**, outfit, 14-\*567
- Woodworking industry**, United States, 7-343-F
- Woodworking tools**, *see* Tools, woodworking
- Woodworth, Robert Sessions**, classifies odors, 2-309
- Woof** (weft)
  - basket weaving, 12-135
  - tapestry weaving, 12-138
  - thread, 10-342
- Wool and woolen industry**, main article, 9-†74-81
  - alpaca, 4-\*399
  - Australia, 9-\*80
  - breeding sheep for, 9-†75, \*77
  - British industry, 6-54; 9-74
  - clothing of cotton and of wool compared, 14-†550
  - fiber, 9-29
  - Flanders once center of woolen industry, 11-197
  - Shetland wool, 6-486
  - United States, 7-343-F
  - wool grown by Incas, 4-399
  - wool prepared and spun by hand, 5-\*410, \*411
  - wool sheared and prepared for market, 9-\*80, 81
  - wool used in rug weaving, 12-156
  - see also* Sheep and sheep raising industry
- Wool fiber**, 9-29
- Woolley, C. Leonard**, excavations in U'r, 5-14
- Woolly bear**, caterpillar, 3-\*291, 293
- Woolly mammoth**, 3-\*55; 4-344; 5-\*26
- Woolly monkey**, 4-263, †264
- Woolsack**, in House of Lords, 9-75
- Woolworth Building**, New York, 11-\*517, 524; 7-\*538
- Worcester, Mass.**, 8-174
- Word hunt**, game, 14-162
- Words**, derivation and changes in meaning, main article, 10-†10-25
  - formation of new words, 10-12
  - origin and development, 10-1
  - see also* Language and languages
- Wordsworth, Dorothy**, 13-215
- Wordsworth, William, life and works**, main article, 13-†214-16
  - and Coleridge, 13-218
  - contemporaries, 6-86
  - friendship with Dr Quincey, 13-233
  - portrait, 13-\*215

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Work**, physics, main article, 1-†333-41  
 defined, 1-333  
 examples of, and their explanation, 1-†333-38  
 measurement of, 1-338  
**Workbench**, how to make, 14-†29  
**Worker ant**, 3-321, 322  
**Worker bee**, 3-†310, †313  
**Worker wasp**, 3-306  
**Working class**, 7-549-50; *see also* Labor  
**Workingmen**, Ruskin's aid to, 13-238  
**Workshop**, how to build, 14-†28  
**Workshops of art**, *see* Art, schools and workshops  
**World, Seven Wonders of the**, *see* Seven Wonders of the World  
**World**  
 early theories concerning composition, 13-2  
 map, 5-573  
 Northern and Southern hemispheres, 5-518-B  
*see also* Earth  
**"World as Will and Idea, The,"** by Arthur Schopenhauer, 13-23  
**World Court of International Justice**, 7-338  
**World Economic and Monetary Conference**, 1933, 7-†341-A  
**"World I Live in, The,"** by Helen Keller, 12-568  
**World Scout Jamboree**, England, 14-543  
**World Series**, baseball games, 14-508  
**World trade**, *see* International trade  
**World War I**, 6-235-39  
 agricultural boom, 7-458  
 Allied battle line at time of armistice: German advance in France, map, 3-262  
 America's neutrality, 12-550  
 armaments, 10-†360-62; 7-\*318  
 Armistice, 7-327  
 aviation in, 10-318, 362; 7-\*327  
 Balkan states changed by, 6-357, 360, 363  
 battles, *see names of battles, as* Falkland Islands, Battle of  
 beginning of, 6-235, 274  
 camouflage, 1-440  
 canning industry in United States stimulated by, 9-228  
 countries participating in, 6-235-37  
 Australia, 5-560  
 Austria-Hungary, 6-235, 274  
 Belgium, 6-346, \*348  
 Canada, 7-28  
 Czechoslovakia, 6-358  
 England, 6-104, \*105; 7-318; 12-551  
 France, 6-201  
 Germany, 6-235-38; 7-320; 10-310; 12-551  
 Greece, 5-182  
 India, 5-386  
 Italy, 6-310  
 Japan, 5-364  
 New Zealand, 5-540  
 Portugal, 6-342  
 Roumania, 6-360  
 Russia, 6-438  
 Serbia, 6-235, 274  
 South Africa, 5-491

**World War I**, countries participating in—*cont.*  
 Turkey, 5-414  
 United States, 12-550, 551, 554, 555; 7-†315 fol., 331  
 debts, 6-202, 239, 314; 7-339, 340  
 dogs' services, 4-503  
 effect upon Germany, 6-237  
 General Pershing's part in, 12-†554, 555  
 inflation a result of, 7-508  
 Latvia ruined by, 6-462  
 Liberty Bonds, 7-529  
 literature a result of, 13-351, 355  
 map of Europe changed by, 6-238  
 Newfoundland's part in, 7-33  
 reaction upon Jews, 5-138  
 results, 6-238  
 submarine warfare, 12-551; 10-310; 7-320  
 transportation  
   food and equipment, 7-\*314  
   motor trucks, 7-\*319  
 weapons and fighting methods, 6-104; 7-\*319 fol., 484; 10-318, 360-68  
 Woodrow Wilson's part in, 12-551  
 work of the Red Cross, 7-\*425, 430  
**World War II**, *see* Index, 6-493  
 armaments, 10-†362-68-F, \*348  
**World War memorial**, Indianapolis, Ind., 8-\*111  
**"World's best loser"** (Sir Thomas Lipton), 14-530  
**World's Fair**, Chicago, 1893, architecture, 11-514  
**World's Fair**, Chicago, 1933, opened by light from star Arcturus, 1-†413  
**Worm from the tomb of Italy** (Catherine de' Medici), 6-176  
**Worms**  
 ability to grow new tail, 3-266  
 first appearance on earth, 3-64  
 marine worms, 3-†117-26  
   first appearance in Cambrian period, 3-9  
   tube builders, 3-†117-23  
**Worms, Diet of**, 1122, 5-297  
**Worms, Diet of**, 1521, 6-212  
   Luther's trial, 13-544  
**Worship**, *see* God; Gods; Religion  
**Worship, animal**, *see* Animals, sacred  
**Worship, fire**, *see* Fire worship  
**Wounds**, first aid treatment for, 2-†399-412  
**Woven houses**, 5-\*527  
**Wrangel Island**, Arctic Ocean, map, 13-502-A  
**Wrangell, Mount**, Alaska, 8-16  
**Wrasses**, fishes, 3-205  
**"Wreck of the Hesperus, The,"** by Longfellow, 13-303  
**Wren, Sir Christopher**, 11-492, 493  
   designs copied by American architects, 11-502  
   furniture designs influenced by, 12-188  
   London rebuilt by, 6-70  
   portrait, 11-\*493  
**Wrens**, birds, 4-†20, 21  
   cactus, 4-142

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

**Wrens—continued**

- European, 4-171, 175
- gold-crested, a warbler, 4-173
- marsh wren, 4-101
- reaction to cowbird's egg, 4-89
- nest building, 4-20, 21, 101
- Wright, Allen**, Choctaw delegate, 8-320-B
- Wright, Gladys Yoakum**, lyric song by, 8-386-A
- Wright, Frank Lloyd**, architect, 11-524
- Wright, Orville and Wilbur**
  - gliders and airplanes made by, 10-317
  - monument, 7-\*413, 414
  - Orville's first flight, 7-304
  - portraits, 10-\*317
  - trial flight at Kitty Hawk, 10-313, \*316
- Writers**, biography, *see* Contents Volume 13
- see also* Literature; and names of writers, as Ibsen; Longfellow
- Writing, origin and development**, main article, 10-†34-45
  - Aramaic, 5-91
  - beginning of history with spread of, 5-42
  - Chinese ideographs, 5-315, 327; 10-\*37
  - Cretan, 5-144
  - Etruscan, 5-192
  - Greek, 5-153
  - material and mediums used, 5-87; 9-273, †274, \*276; 10-\*35, †43 fol.
  - Maya Indians, 10-\*478; 5-495
  - numerals, 10-†421-23
  - picture writing, 10-†35-38; 7-108
  - primitive Scandinavian, 6-373, †374
  - runic writing, 6-†374
  - secret writing, 14-†143-48
  - shorthand, 10-45
  - Siamese, 5-428
  - see also* Alphabet; Cuneiform inscriptions; Hieroglyphics
- Writing case**, Syrian, 12-\*90
- Writing desks**, *see* Desks
- "Writing on the wall,"** interpreted by Daniel, 5-\*128
- Writs of Assistance**, 7-160
- Wrought iron**, 9-401
  - balconies, 8-\*143
- Wu Hou**, Chinese empress, 5-325
- Wu Tao-yuan**, Chinese painter, 5-326
- Wu Ti**, Chinese emperor, 5-320
- Wu T'ing-fang**, leader of Chinese Revolution, 5-334
- Wu Wang**, Chinese emperor, 5-317
- Wupatki National Monument**, Ariz., 8-24-A
- Württemberg**, state, Germany, map, 6-582
- "Wuthering Heights,"** by Emily Brontë, 13-248
- Wyandot Indians**, in Ohio, 8-305
- Wyandotte**, breed of chicken, 9-\*350
- Wyandotte Cave**, Ind., 8-116
- Wyatt, Margaret**, Lady Lee, portrait by Holbein, 11-\*214
- Wyatt, Thomas**, English poet, 11-214
- Wycliffe, John**, efforts to reform church, 6-†33, 41
  - Bible translated by, 6-32

**Wycliffe, John—continued**

- followers of, 6-†33, 35, 36
- John Huss influenced by, 13-536
- Wylie, Eleanor**, poet, 13-352
- Wylie, Lottie Belle**, music to "Georgia" written by 8-84-A
- "Wynken, Blynken, and Nod,"** by Eugene Field, 13-343
  - quoted, 13-344
- Wyoming**, state, U. S., **description and history**,
  - main article, 8-†448-53; general data, 8-454, 454-B
  - agriculture, 8-452, 453
  - American Dust Bowl, 7-466
  - area, 8-454
  - capitol building, 8-\*448
  - charities and correction, 8-454
  - cities, towns, list, 8-454-A
  - climate, 8-454
  - counties, 8-454-A
  - education, 8-453
    - institutions of higher learning, list, 8-454
  - elevation, 8-216
  - flag, 8-454-A
  - fossils found in, 3-15
  - Grand Teton National Park, 7-406
  - history
    - admitted to Union, 8-451
    - included in Mormon State, "Deseret," 8-393
  - holidays, 8-445-A
  - in pioneer days, 7-233
  - Indians, 8-451
    - reservation, 8-454-A
  - location, 8-454
  - map, 8-558
    - on United States map, 7-594
  - monuments, 8-454-A
    - Devil's Tower, volcanic formation, 7-417, \*418
    - Shoshone Cavern, 7-419
  - motto, 8-454-A
  - name, 8-454-A
  - nicknames, 8-454-A
  - parks, 8-454-A; *see also* Yellowstone National Park
  - physical features, 8-449, 454
  - political facts, 8-454
  - population, 8-453
  - portion included in Idaho territory, 8-89
  - products and industries, 8-451-52, \*453
    - mines and mining, 8-451
  - reservations, game and bird, 8-454-A
  - rivers, 8-454, 449
  - rock upheaval in, 1-\*75
  - state bird, 8-454-A
  - state flower, 8-454-A
  - state song, 8-454-A
- Wyoming, University of**, 8-454
  - University Hall, 8-\*449
- Wyoming Pass**, crossed by pioneers, 7-233
- Wyoming Valley**, Penn., dispute over, 8-336
  - name of interest, 8-454-A

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



**X-ray tube**, 1-514  
**X rays**, main article, 10-†492-95  
 digestive process reflected by, 2-353, \*354  
 length, 1-419  
 of man's foot, 2-\*323  
 uses, 10-†493-95  
   in studying structure of matter, 1-361  
**Xanthate**, cellulose, 9-84, 86  
**Xanthippus**, in command at Carthage, 12-351  
**Xanthus**, philosopher of Samos, 13-41  
**Xavier, Francisco (Francis), Saint**, in Japan, 5-354  
**Xenon**, gaseous element  
   in air, 1-376  
   symbol, atomic no. and wt., 1-\*551

**Xenophanes**, discovers fossils in mountains, 1-21  
**Xenophon**, Greek historian, "Anabasis" by, 5-177  
**Xerxes the Great**, king of Persia, 5-103  
   bridge across Hellespont, 9-284  
   invasion of Greece, 5-163  
   relief from palace of, at Persepolis, 11-\*29  
**Xiphosúra** (king crab), first appeared, 3-64  
**XS-1**, fast rocket plane, 10-328-V  
**Xylem**  
   leaf, 2-26  
   root, 2-38  
   stem, 2-29, 31, \*33  
**Xylophone**, musical instrument, 12-258-C  
**X Y Z Affair**, 7-198



**Yacht racing**, main article, 14-†527-30  
   Newport, 8-348  
**Yachts**, sailing vessels, 14-†527, \*529; 10-\*173  
**Yadkin River**  
   Great Peedee continuation of, 8-356  
   North Carolina, 8-296  
**Yaffle** (woodpecker), 4-174  
**Yahweh**, God of Hebrews, 5-119, 125  
**Yak** (grunting ox), 4-\*394, 396; 5-\*437  
   milk, 9-332  
**Yakonan Indians**, 8-328  
**Yale University**, New Haven, Conn., 8-61  
   boat races, 14-533  
   Harkness Memorial Building, 8-\*56  
**Yam**, edible root, 9-145  
   flour made from, 9-239  
**Yampa River**, Colo., 8-52-A  
**Yangtze River**, China, rising in Tibet, flowing to China Sea, 10-263; 5-336-A  
   basin area, 10-257  
   length, 10-253  
   map, 5-591  
**Yangtze Valley**  
   climate, 5-336-A, 336-C  
   industry, 10-263  
**"Yankee Doodle,"** song, 12-476  
**Yankee Galahad** (John G. Whittier), 13-306  
**Yankee State** (Ohio), 8-312-B  
**Yao**, Chinese emperor, 5-316  
**Yaocomico Indians**, land sold to white man, 8-158  
**Yap**, one of Caroline islands, Pacific Ocean  
   stone money used on, 5-528  
   see Caroline Islands  
**Yard**, measure, 10-374, 375  
**Yard dash**, game, 14-159

**Yards**, of a square-rigged vessel, 10-171  
**"Yardstick of the universe,"** distance of earth from sun, 1-14  
**Yarn**  
   in rope making, 9-\*286  
   made from jute fibers, 9-310  
   spinning of, 10-†339-42  
**Yaroslav**, grand prince of Kiev, ruler of Russia, 6-425  
**Yarrow**, plant, 2-\*173  
**Yasnaya Polyana**, home of Count Tolstoy, 13-90  
**Yawl**, sailboat, 10-171  
**Yawning**, aid to hearing, 2-304  
**Yazoo Delta**, 8-201, 205, 206  
**Yazoo River**, U. S., 8-206  
**"Ye Olde Cheshire Cheese,"** London, 13-\*193  
**Year**  
   calculated by shepherds, 1-100  
   division of, in calendars, 10-†475-83  
   length, 10-\*469  
   measure of earth's revolution, 1-13  
   planets, 1-106  
     Jupiter, 1-154  
     Mars, 1-150  
     Mercury, 1-146  
     Saturn, 1-157  
     Uranus, 1-158  
     Venus, 1-148  
**Year one**, oldest date, origin in Egypt, 5-49  
**"Yeast,"** by Charles Kingsley, 13-247  
**Yeast**, in bread making, 9-243  
**Yeats, W. B.**, Abbey Theatre, 12-333  
**Yedi Kuleh**, Turkish fortress, Constantinople, 5-\*404  
**Yedo**, Japan, former name for Tokyo, 5-356

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- ("Yellerhammers," nickname for people of Alabama, 8-8-A  
**Yellow**, color, color plate, 1-435, 440  
 dyes, 12-157; 9-305, 306, 447  
**Yellow baboon**, 4-259  
**Yellow-bellied flycatcher**, 4-43  
**Yellow-bellied sapsucker**, color plate, 4-\*89  
**Yellow-bellied terrapin**, 3-\*473  
**Yellow-billed cuckoo**, 4-†75  
**Yellow bird**, summer, 4-59  
**Yellow-breasted chat**, bird, graph of song, 4-\*5  
**Yellow fever**  
     mosquito carrier of, 2-388; 3-362  
     stamped out in Panama and Cuba, 7-307  
**Yellow-footed armadillo**, 4-455  
**Yellow-hammer (flicker)**, bird, 4-†71-72, 172  
     Alabama, 8-8-A  
**Yellow Hand**, Indian killed by Buffalo Bill, 12-574  
**Yellow-headed bluebird**, color plate, 4-\*88  
**Yellow jacket**, stinging insect belonging to wasp family, 3-306  
     nest, 3-\*296  
**Yellow jasmine**, South Carolina's state flower, 8-356-A  
**Yellow locust**, 3-347  
**Yellow pine**, 2-\*266  
     Mississippi's production, 8-205  
**Yellow poplar (tulip tree)**, 2-\*273  
**Yellow (Mongolian) race**, 5-†43  
     in Pacific Islands, 5-522  
**Yellow River**, see Hwang, river  
**Yellow Sea**, Asia, maps, 5-591, 581  
**Yellow-shouldered Amazon parrot**, 4-\*192  
**Yellow sponge**, 3-87  
**Yellow spot of eye**, 2-\*296, 298  
**Yellow-throated vireo**, bird, 4-\*61  
**Yellow-throated warbler**, 4-\*59  
**Yellow warbler**, bird, 4-†58-59, \*4  
     color plate, 4-\*25  
     reaction to cowbird's egg, 4-89  
**Yellowstone canyon**, 1-36  
**Yellowstone Lake**, 7-406  
**Yellowstone National Park**, Wyoming, 7-†404-5  
     406; 1-35-36  
     area, 8-454-A  
     bears, 4-\*314  
     geysers, 1-\*33, †34-36  
     Grand Canyon, 1-36  
     map, 8-517  
     mineral springs, 1-36  
     Montana's entrance, 8-220-A  
     petrified trees, 9-315  
**Yellowstone River**, U. S., 8-454; canyon, 7-406  
     Montana, 8-220  
     Wyoming, 8-454  
**Yemassee Indians**, attack English, 8-351  
**Yemen**, country, Arabian peninsula, 5-395, 401  
     flag, color plate, 14-following 570, no. 71  
     maps, 5-583, 580  
**Yen Ti (Shen Nung)**, Chinese ruler, 5-315  
**Yenisei River**, Siberia  
     basin area, 10-257  
     length, 10-253  
     map, 6-602  
**"Yeomen of the Guard, The,"** by Gilbert and Sullivan, 12-320  
**Yerba Maté**, South American beverage resembling tea, 9-138  
**Yerkes Observatory**, Williams Bay, Wis., 1-110, \*154  
     telescope, 1-\*189  
**Yermak**, see Ermak-Timofeevich  
**Yew**, tree  
     extreme age, 2-260  
     flowers, 2-99  
**Yezo**, island, Japan, 5-364-B; map, 5-592  
**Yezzo bear**, 4-\*319  
**Yiddish**, Jewish dialect, 5-136  
**Yin (Shang) dynasty**, China, 5-316  
**Ymir**, mythological giant, 6-370  
**Yngling, house of**, rule of Sweden, 6-393  
**Yniol**, earl, in, Arthurian legend, 14-383  
**Yockee-bird**, see Flickers  
**Yoga**, Hindu philosophy, 5-369  
**Yoho National Park**, Canada, 7-29-W  
**Yoke**, worn by peasants, 6-\*392  
**Yokohama**, Japan  
     coaling station, 10-237  
     earthquake, 5-364-B  
     on North Pacific route, 10-242  
**Yolk sac**, of salmon, 3-\*247  
**"Yonker Ramp and His Sweetheart,"** painting by Frans Hals, 11-\*263  
**Yoritomo**, Japanese shogun, 5-349, 350  
**"York,"** origin of word, 8-284-A  
**York**, archbishopric of, 6-10  
**York, Duke of (Richard)**, 6-\*30, \*38, 39  
**York, house of**, claim to English throne, 6-37, 38  
**York (Toronto)**, Canada, made capital of Upper Canada, 7-14  
**York, Maine**, founding of, 8-152  
     first sawmill, 8-153  
**York River**, Va., 8-418, 410  
**Yorkshire**, county, England, jet found in, 9-444  
**Yorkshire**, early name given to Long Island, 8-284-A  
**Yorkshire moors**, England, 6-108-B  
**Yorktown**, Va., battle at  
     attack led by Alexander Hamilton, 12-508  
     Cornwallis' surrender, 12-478; 7-170  
     commemorative monument, 8-\*408  
     historical points, 7-412, 413, 414; 8-\*408  
     national cemetery, 8-418-A  
**Yosemite Creek**, 7-409  
**Yosemite Falls**, Yosemite National Park, 7-\*408  
**Yosemite National Park**, California, 8-42-B; 7-407, \*408  
     giant trees, 2-\*253; 9-\*245  
     toboggan slide, 14-\*483  
**Yosemite Valley**, Calif., 8-42-B  
**Yoshimune**, Japanese shogun, 5-359

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.

- Yoshitsune**, Japanese warrior, 5-349, 350  
**"You Never Can Tell,"** drama by George Bernard Shaw, 13-272  
**Youghal lace**, 12-\*165  
**Youghiogheny River**, U. S., 8-162-A  
**Young, Brigham**, Mormon governor, 8-393  
**Young, James**, experiments with petroleum, 9-450  
**Young, John**, settles Youngstown, Ohio, 7-\*178  
**"Young Beggar, The,"** painting by Murillo, 11-\*255  
**"Young Bull,"** painting by Paul Potter, 11-\*265  
**Young Germany**, struggle for democracy, 6-227  
**"Young Girl with Pearl Earrings,"** painting by Corot, 11-\*326  
**"Young Girls,"** lithograph by Renoir, 11-\*381  
**Young Ireland**, patriotic group, 6-160  
**Young Italy**, Italian society, 6-306; 12-445  
**Young Plan** for German reparations, 6-202, 239  
**Young Pretender**, see Charles Edward Stuart  
**"Young Scholar, The,"** by Lessing, 13-287  
**"Young Woman Knitting, A,"** painting by Chardin, 11-\*283  
**Youngberry**, 9-158  
**"Younger Edda,"** by Snorri Sturluson, 6-420  
**Youngstown, Ohio**, founding of, 7-\*178  
     iron manufacture, 8-311  
**"Youth,"** by Joseph Conrad, 13-274  
**"Youth Binding His Hair,"** statue by Polyclitus, 11-\*39  
**"Youth Scraping Himself,"** statue, 11-54, \*55  
**Yozo Creek**, Montana, sapphire production, 8-218  
**Ypres**, Belgium, 6-347, 350  
     Cloth Hall, 11-\*469  
     map, 6-593, A-4  
**Yssel River**, Holland, 6-355-A  
     map, 6-592  
**Ytterbium**, element, symbol, atomic no. and wt., 1-\*551  
**Yttrium**, element, symbol, atomic no. and wt., 1-\*551
- Yu Ch'ao**, in Chinese mythology, 5-314  
**Yü, the Great**, Chinese emperor, reign, 5-316, 318  
**Yuan Shih-k'ai**, president of China, 5-334  
**Yucatan**, peninsula, Central America  
     map, 7-597  
     Maya Indians, 7-90, \*92  
**Yucatan**, state, Mexico, map, 7-597  
     Sisal, 9-285  
**Yucca House National Monument**, 8-52-B  
**Yucca plant**, moccasin made from, 9-\*60  
     New Mexico's state flower, 8-262-A  
**Yugoslavia**, country, Europe, description and history, 6-†364-66; general data, 6-290-A-290-B  
     agriculture, 6-\*365  
     area, 6-290-A  
     climate, 6-290-A  
     financial aid, 6-241  
     flag, color plate, 14-following 570, no. 72  
     government, 6-290-B  
     location, 6-290-B  
     maps, 6-587  
         on map of Europe, 6-570  
     merchant marine, 10-232  
     people, 6-290-B  
     physical features, 6-290-A, 364  
     products, 6-290-B  
     provinces, 6-290-B  
     relations with Austria and Hungary, 6-286  
     rivers, 10-259  
**Yukon**, terr., Canada, 7-29-W-X, 33-A, 33-B  
     border settlement, 7-28  
     government, 7-33-K, \*33-L  
     map, 7-592  
**Yukon Delta Reservation**, Alaska, 4-517  
**Yuko River**, No. Amer., 8-16, 10-257  
     map, 8-560  
**Yule log**, 14-590  
**Yuma**, Ariz., Imperial Dam, 8-42  
**Yuma Indians**, 8-22  
     California, 8-36  
**Yung Lo**, Chinese emperor, 5-330



- Zacatecas**, state, Mexico, map, 7-596  
**Zach, Franz Xaver**, Baron von, 1-152  
**Zahringer Fountain**, Berne, 6-\*252  
**Zama, Battle of**, 5-216  
**Zambezi River**, Africa, flowing through East Angola, Rhodesia, and Portuguese East Africa, 5-473-A  
     basin area, 10-257  
     explored by Livingstone, 13-553  
     map, 5-577  
     Victoria Falls, 5-\*486  
**Zamenhof, L. L.**, invents Esperanto, 10-7  
**Zamora y Torres, Niceto Alcalá**, president of Spain, 6-335
- Zane brothers**, pioneers of Ohio, 8-316  
**Zane's Trace**, first road in Ohio, 8-310  
**Zanesville**, Ohio  
     bridge, 10-\*211  
     factories, 8-310  
     pottery manufacture, 8-311  
**Zanni**, comedy character, 12-329  
**Zany**, fool, 12-329  
**Zanzibar**, sultanate, Africa, 5-461  
     cloves grown in, 9-209  
     native girls, 5-\*462  
**Zapote**, tree, chicle from, 2-292  
**Zealand**, island, Denmark, 6-416-B  
     map, 6-599

The asterisk (\*) refers to picture and its explanation only. The obelisk (†) refers to illustrated text.



- Zebra**, animal of horse tribe, 4-350 fol., \*506, 508; 5-\*445  
 baby being fed in zoo, 4-\*476  
 drawing and mounting, 14-\*66  
 roams with antelopes and ostriches, 4-233  
 species, 4-\*351
- Zebu**, animal  
 domesticated, 4-394  
 milk, 9-332
- Zeck, Jacob**, watches made by, 10-468
- Zeebrugge**, Belgium, 6-350
- Zeeland**, province, Holland, 6-345
- Zeelandia Nova**, name for New Zealand, 5-532
- Zeno**, Stoic philosopher, 13-11
- Zephaniah**, Hebrew minor prophet in Old Testament, 5-126
- Zephyr** (Zephyrus), west wind in Greek mythology, 14-433, \*434  
 and Flora, 14-\*434  
 kills Hyacinth, 14-442
- Zeppelin, Ferdinand, Count von**  
 airships made by, 10-314
- Zeppelins**, airships, 10-314  
 land Zeppelin, 10-\*199  
 radio service to, 10-118
- Zermatt**, Switzerland, 6-\*244
- Zero**, on thermometer, 1-208
- "Zerohoure,"** 10-362
- Zeus** (Jupiter) god  
 altar to, in Pergamon, 11-56, \*416
- Zeuxis**, Greek painter, 11-49, 50
- Zevi, Sabbatai**, 5-138
- Ziggurats**, Assyro-Babylonian temples, 11-23, 25  
 at Ur, 11-24, 404, \*405; 5-\*11, 14  
 E-temenanki at Babylon, 5-16
- Zigzag ornament**, 11-\*474
- Zimbalist, Efrem**, violinist, 12-258
- Zinc**, element, 9-420  
 combined with copper to make brass, 9-419  
 electric cell, use in, 1-496, \*497  
 Europe, 6-162-10  
 German silver contains, 9-420  
 melting point, 1-\*392  
 mined with lead and silver, 8-328  
 symbol, atomic no. and wt., 1-\*551  
 United States, 7-343-E  
 Utah's output, 8-395
- Zinnia**, flower, 2-\*228
- "Zion,"** 5-127
- Zion Canyon**, Utah, 8-396-A
- Zion National Park**, 8-396-A
- Zionist movement**, 5-138, 141
- Zircon**, precious stone, color plate, 9-frontispiece
- Zirconium**, element, symbol, atomic no. and wt., 1-\*551
- Zither**, musical instrument, 12-258-E, \*221
- Zither clavier**, musical instrument, 12-\*221
- Zizag bittern**, bird, 4-\*109
- Zobaa**, whirlwind of sand, 5-73-B
- Zodiac**, signs of: origin of word, 1-†170, †77, †178
- Zodiacal light**, 1-167
- Zoëas**, young of crab, 3-177
- Zog, Ahmed** (Skanderbeg III), king of Albania, 6-366
- Zola, Émile**, life and works, 13-135  
 portrait, 13-\*135
- Zones of earth**, 1-204  
 temperate, 5-473-B
- Zoning Law**, New York, 11-517, 524
- Zoological parks**, main article, 4-†474-81  
 bears, in, 4-\*315, 317, \*320  
 how to make and mount animals for, 14-†59-69
- Zoölogy**, see Contents Volumes 3, 4  
 animal kingdom classified, 3-†66-70  
 by Agassiz, 13-432  
 by Cuvier, 13-†423-24  
 first book on, 13-9  
 origin of word, 1-177  
 work of Lamarck, 13-†418  
 see also Animals; Evolution; Reproduction
- Zorn, Anders**, Scandinavian engraver, 10-65
- Zoroaster**, Persian prophet, 5-102
- Zoroastrianism**, 5-102  
 evil explained by, 13-12  
 Mohammedanism replaces as state religion, 5-105
- Zoser**, king of Egypt, 5-52
- Zrinyi, Niklas, Count**, Hungarian leader, at Szigetvár, 5-413; 6-\*280
- Zsigmondy, Richard**, demonstration of molecular movement, 1-†357-58
- Zug**, Switzerland, joins Swiss Confederation, 6-248
- Zuider Zee**, inlet, Netherlands, 6-353  
 map, 6-592  
 reclamation project, 6-355-A
- Zukor, Adolph**, moving picture producer, 10-506, 507
- Zulu War**, 5-484, 486
- Zululand**, Natal, South Africa, 5-479
- Zulus**, African Negroes, 5-\*480-81, \*484  
 conflicts with white men, 5-478  
 dwellings, 1-\*196; 5-\*479; 11-\*390  
 race, 5-445
- Zuñis**, Indians, 7-†93, 96  
 ovens, 9-239  
 weaving, 10-\*343
- Zurbarán, Francisco**, paintings, 11-258  
 "Miracle of St. Hugo," painting, 11-\*252
- Zürich**, Switzerland, map, 6-585  
 joins Swiss Confederation, 6-248  
 refuge of Protestants, 6-252  
 war with allied cantons, 6-249
- Zwingli, Ulrich**, starts Reformation in Switzerland, 6-251, 252